BUREAU OF RECLAMATION

Klamath Project
Temporary Operating Procedures

February 3, 2023

Presentation Outline

- Technical input received

- Monitoring Information
- Current Forecasts and Reclamation Interpretation
- Temporary Operating Procedures
- Schedule for Input and Action

- Supplemental Information

Technical Input Received – Concepts for Improving ESA Compliance

Diversion reduction strategies

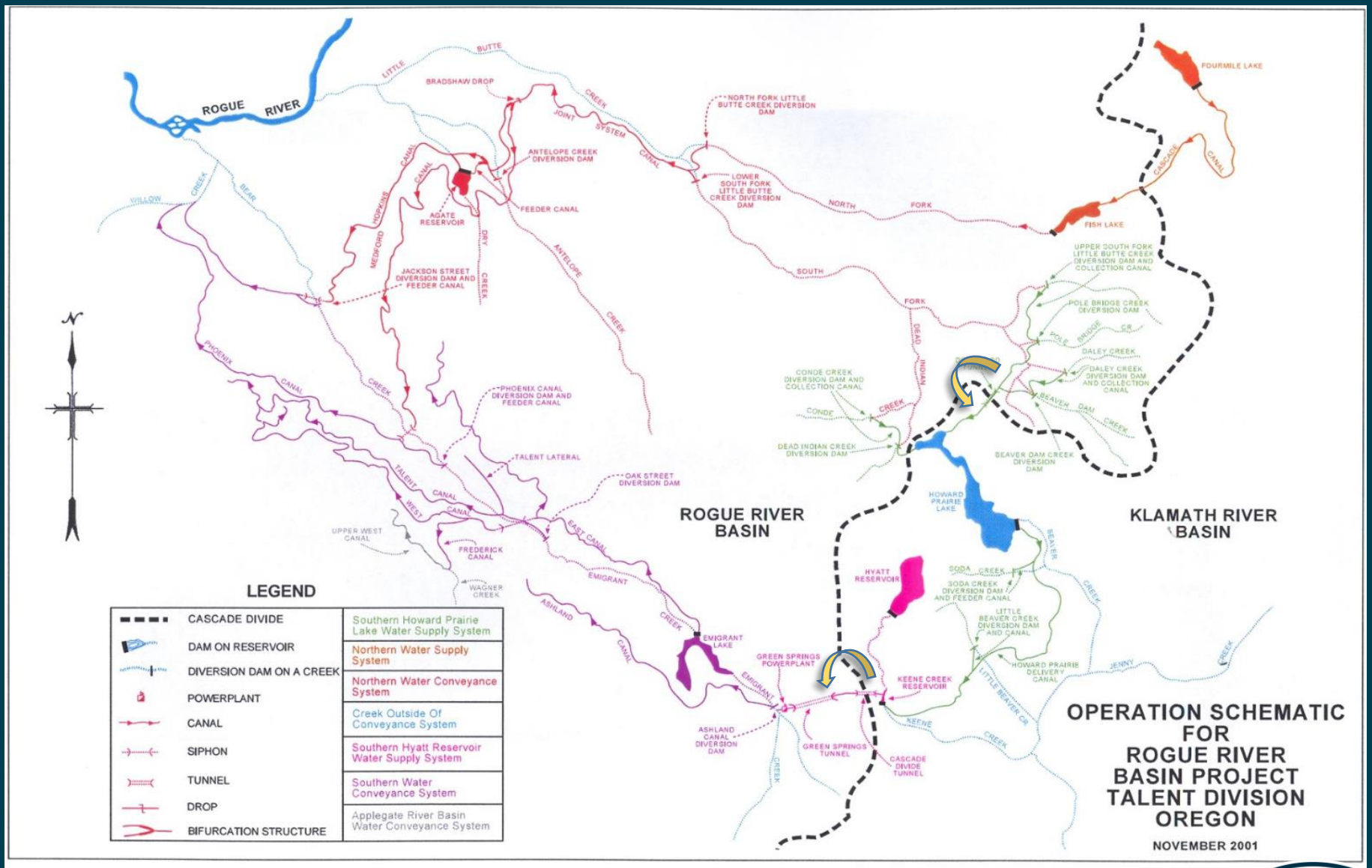
1. Halt out-of-basin diversions to the Rogue River basin
2. Halt diversions from the Keno Impoundment

Supply augmentation strategies

3. Initiate out-of-basin diversions into Klamath River from Lost River
4. Consider planning for a lower volume pulse/flushing flow from Upper Klamath Lake

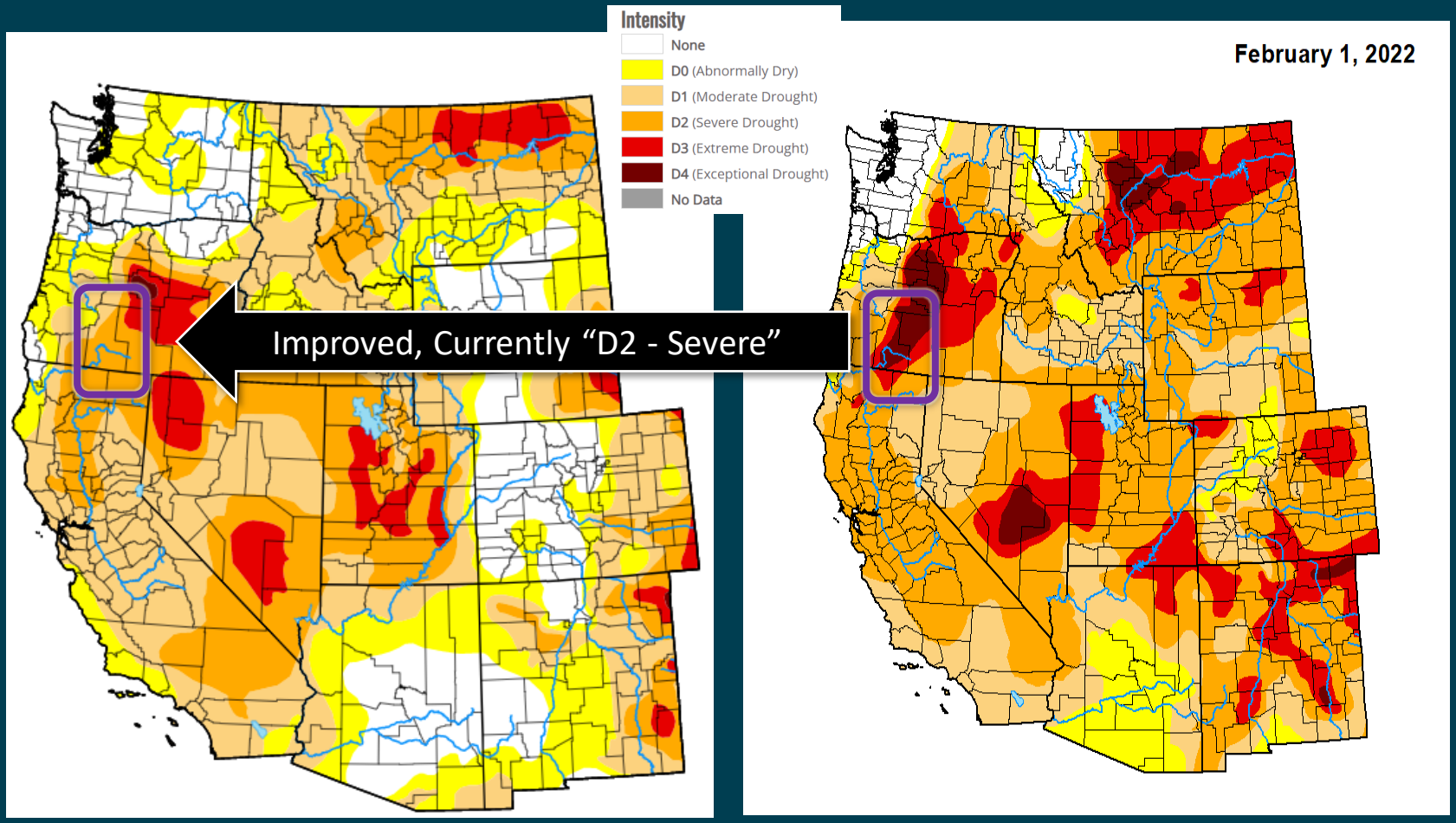
Operation modification strategies

5. Borrow or exchange water with KRRC (former PacifiCorp reservoirs)
6. Reduce Link River Dam outflows to make better use of storm events
7. Establish higher end-of-season elevation requirements for Upper Klamath Lake


ROGUE RIVER
LITTLE BUTTE CREEK
BRADSHAW DROP
JOINT SYSTEM CANAL
NORTH FORK LITTLE BUTTE CREEK DIVERSION DAM
ANTELOPE CREEK DIVERSION DAM
AGATE RESERVOIR
FEEDER CANAL
HOPKINS CANAL
MEDFORD CANAL
DRY CREEK
ANTELOPE CREEK
JACKSON STREET DIVERSION DAM AND FEEDER CANAL
LOWER SOUTH FORK LITTLE BUTTE CREEK DIVERSION DAM
NORTH FORK
SOUTH FORK
WILLOW CREEK
BEAR CREEK
PHOENIX CANAL
PHOENIX CANAL DIVERSION DAM AND FEEDER CANAL
TALENT LATERAL
OAK STREET DIVERSION DAM
TALENT WEST CANAL
EAST CANAL
UPPER WEST CANAL
FREDERICK CANAL
WAGNER CREEK
EMIGRANT CREEK
ASHLAND CANAL
EMIGRANT LAKE
ASHLAND CANAL DIVERSION DAM
GREEN SPRINGS POWERPLANT
GREEN SPRINGS TUNNEL
CASCADE DIVIDE TUNNEL
KEENE CREEK RESERVOIR
KEENE CREEK
LITTLE BEAVER CR
HOWARD PRAIRIE DELIVERY CANAL
HYATT RESERVOIR
SODA CREEK
SODA CREEK DIVERSION DAM AND FEEDER CANAL
LITTLE BEAVER CREEK DIVERSION DAM AND CANAL
BEAVER CREEK
JENNY CREEK
HOWARD PRAIRIE LAKE
BEAVER DAM CREEK DIVERSION DAM
BEAVER DAM CREEK
DEAD INDIAN CREEK DIVERSION DAM
DEAD INDIAN CREEK
CONDE CREEK DIVERSION DAM AND COLLECTION CANAL
CONDE CREEK
DALEY CREEK DIVERSION DAM AND COLLECTION CANAL
DALEY CREEK
POLE BRIDGE CREEK DIVERSION DAM
POLE BRIDGE CR
UPPER SOUTH FORK LITTLE BUTTE CREEK DIVERSION DAM AND COLLECTION CANAL
FISH LAKE
CASCADE CANAL
POURMILE LAKE
ROGUE RIVER BASIN
KLAMATH RIVER BASIN
LEGEND
CASCADE DIVIDE
DAM ON RESERVOIR
DIVERSION DAM ON A CREEK
POWERPLANT
CANAL
SIPHON
TUNNEL
DROP
BIFURCATION STRUCTURE
Southern Howard Prairie Lake Water Supply System
Northern Water Supply System
Northern Water Conveyance System
Creek Outside Of Conveyance System
Southern Hyatt Reservoir Water Supply System
Southern Water Conveyance System
Applegate River Basin Water Conveyance System
OPERATION SCHEMATIC FOR ROGUE RIVER BASIN PROJECT TALENT DIVISION OREGON
NOVEMBER 2001

Monitoring Information

United States Drought Monitor – West Region

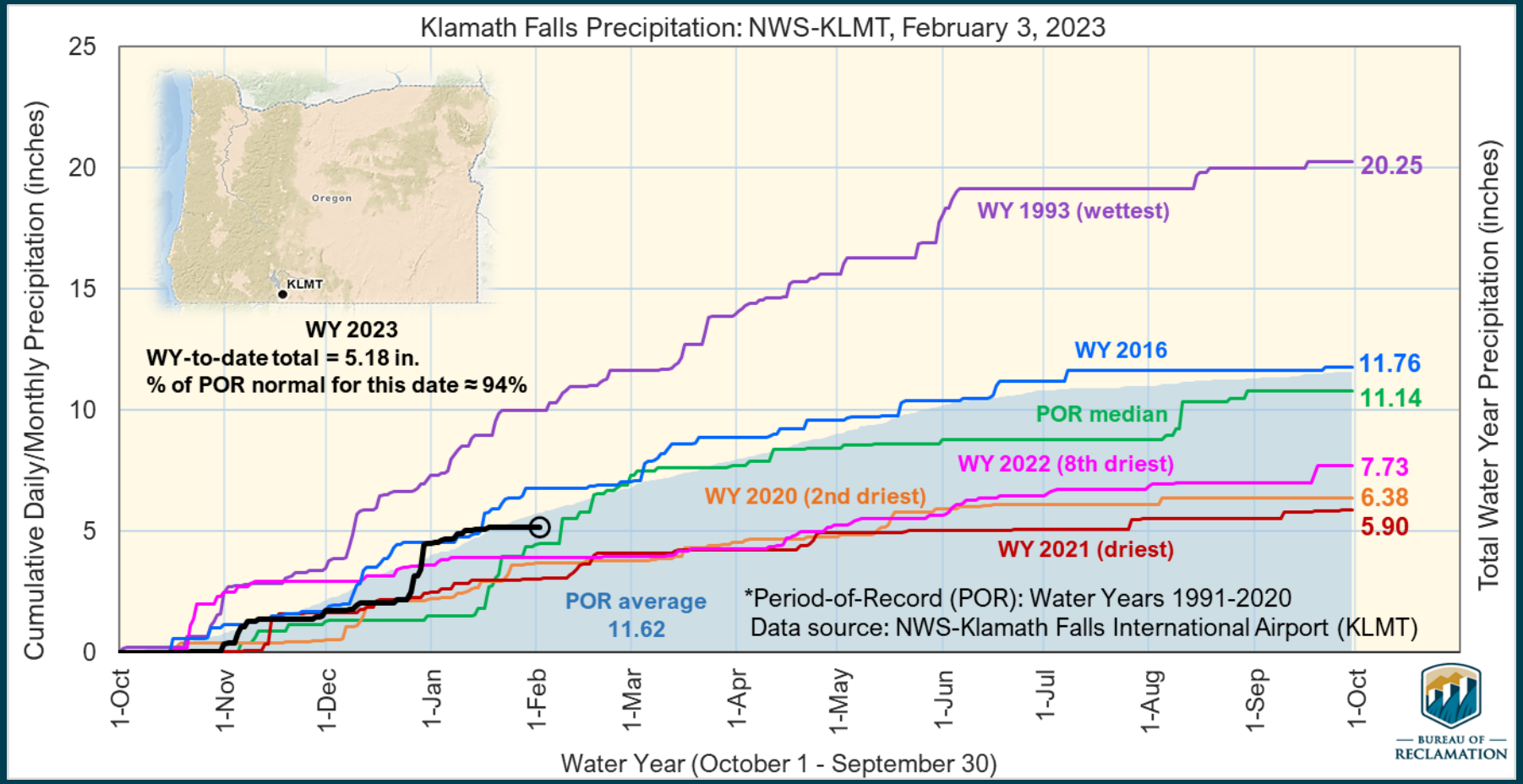


February 02, 2023

February 01, 2022

https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OR

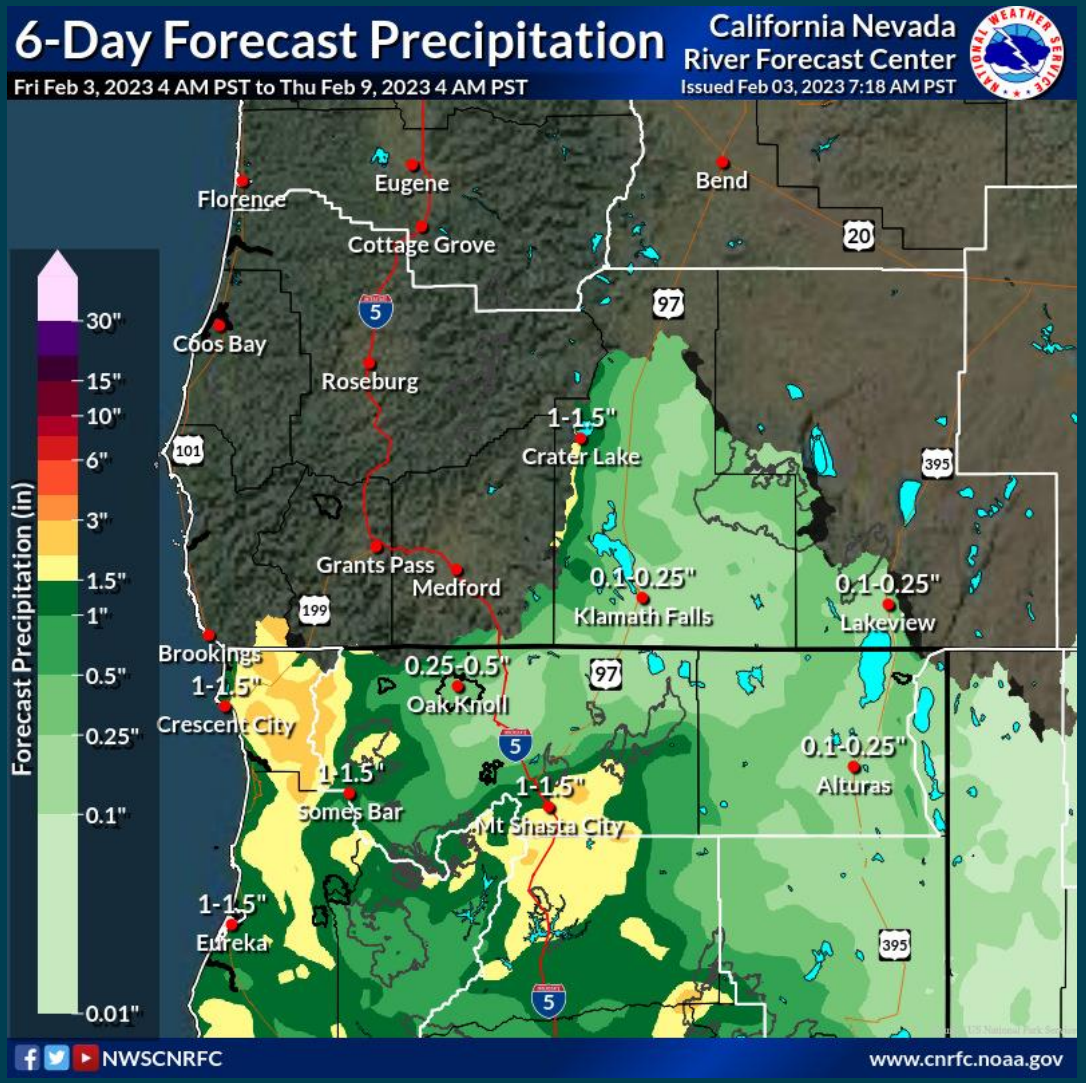
Klamath Falls Airport Met Station – National Weather Service



https://www.weather.gov/wrh/climate?wfo=MFR

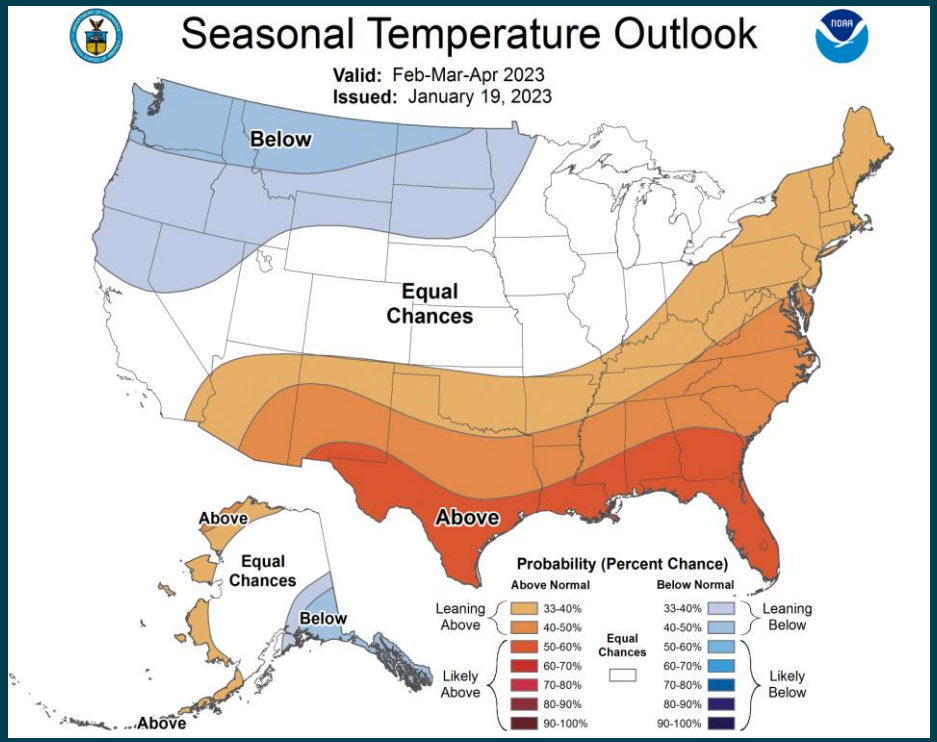
6-Day Precipitation Forecast – California Nevada River Forecast Center

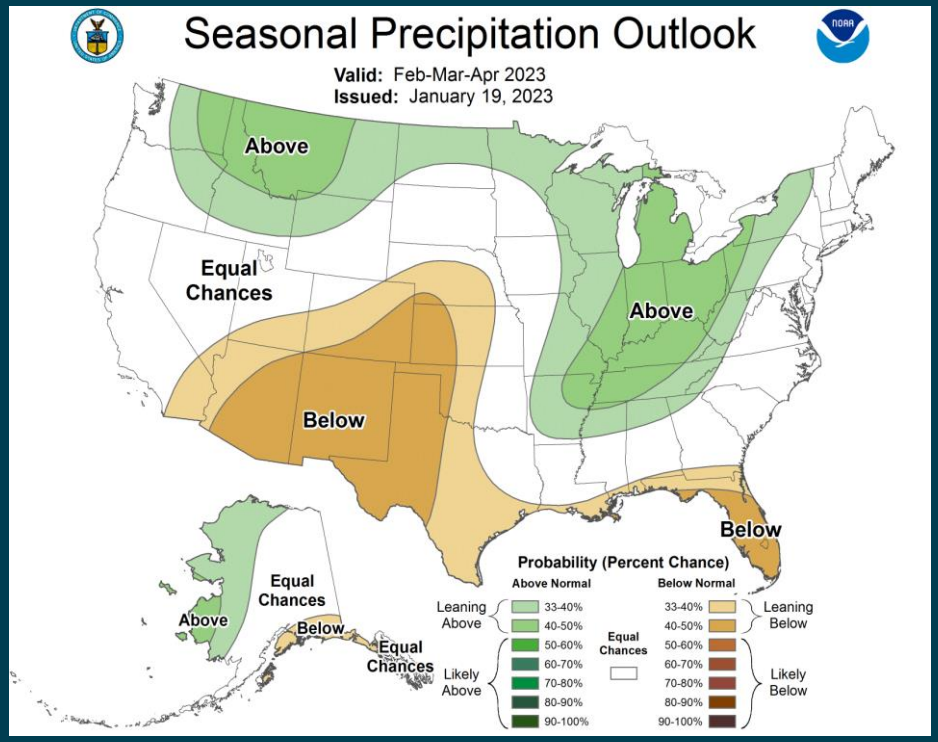
Accumulated Total



https://www.cnrfc.noaa.gov/precipForecast.php?cwa=MFR&imgNum=1&mobile=0

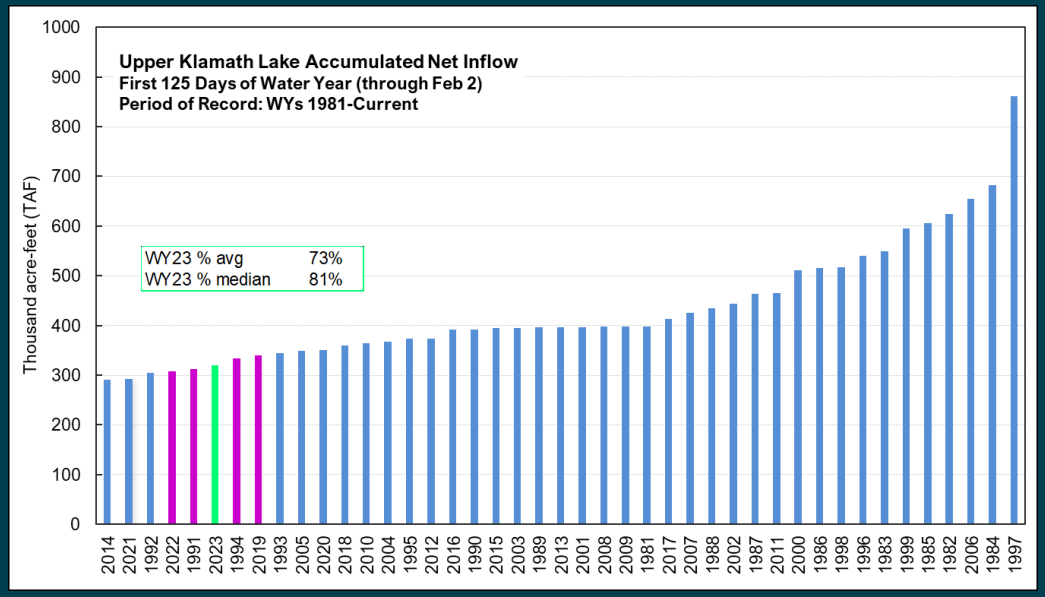
February-March Weather Outlook





https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1

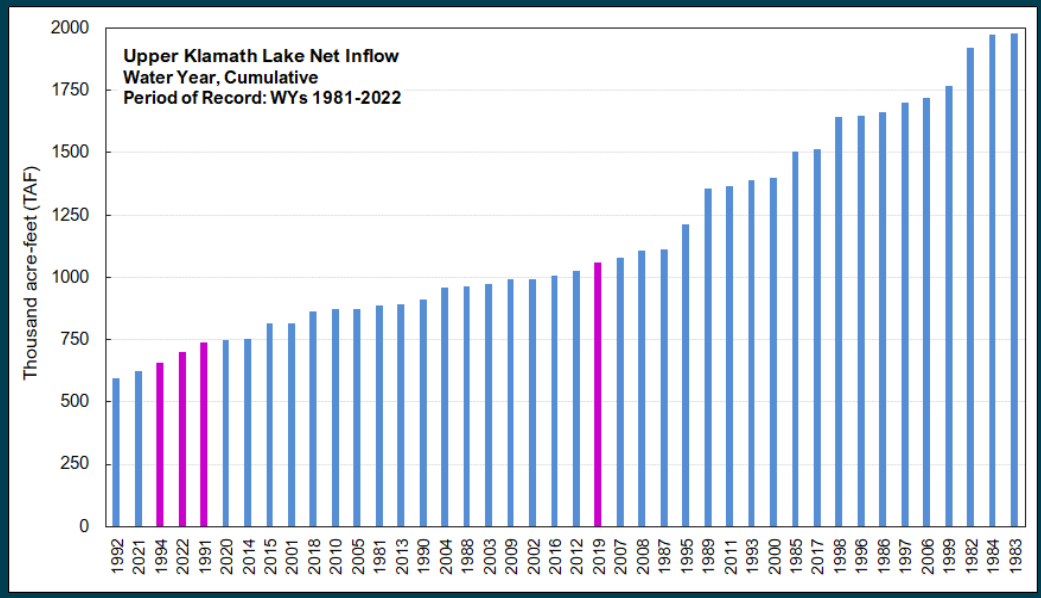
UKL Net Inflow Water - Year 2023 & Nearest Neighboring Water Years for Net Inflows to-Date



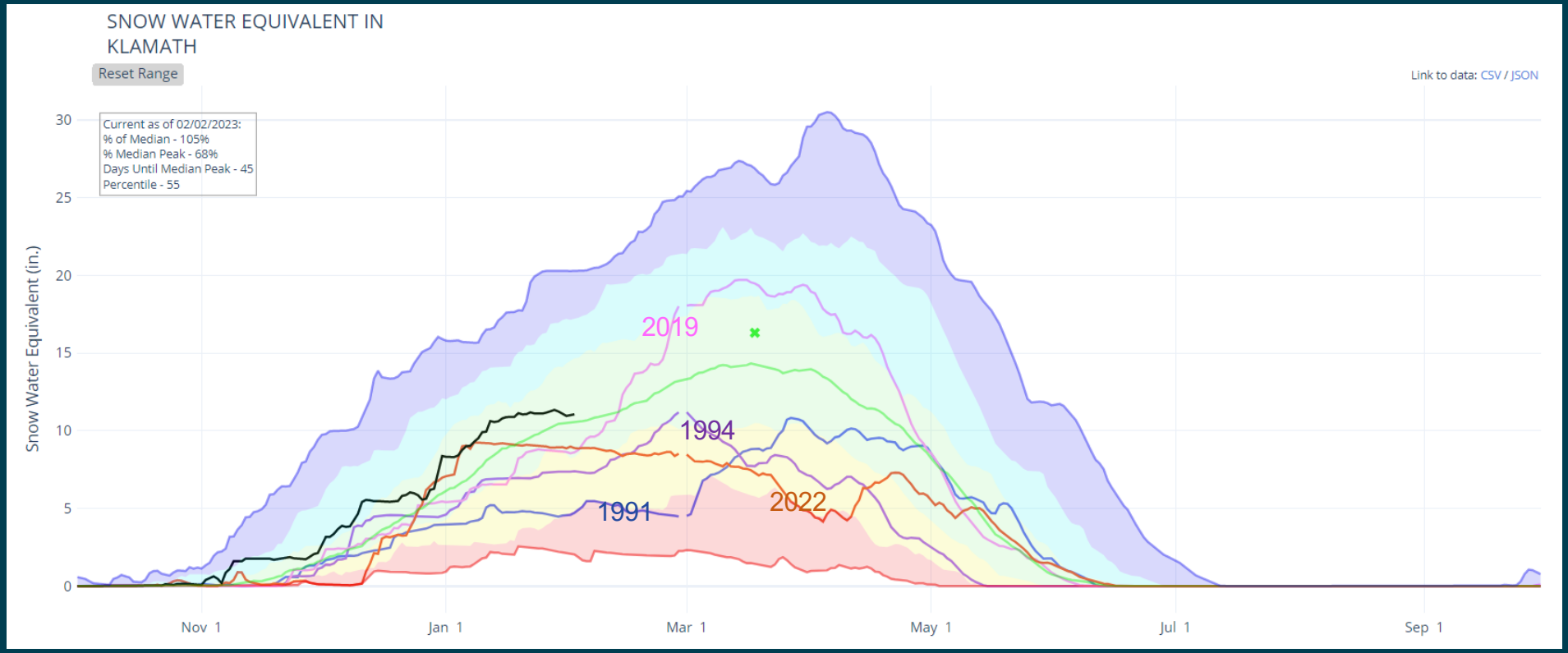
WY2022/2023 data are provisional and subject to revision

*Despite total **Precip** being close to normal **Inflow** has remained outside of the **standard deviation** for the record. Our hypothesis for why is related to dry conditions that have intercepted and retain moisture, as evidenced in baseflow levels into UKL (See upcoming slide 18 on Williamson River).*

While not intended to be a forecast, it is often helpful to recall what happened in years that had equivalent volumes of inflow at this point in the year. 2019 was the only year to escape being low, largely because of February snow accumulation.



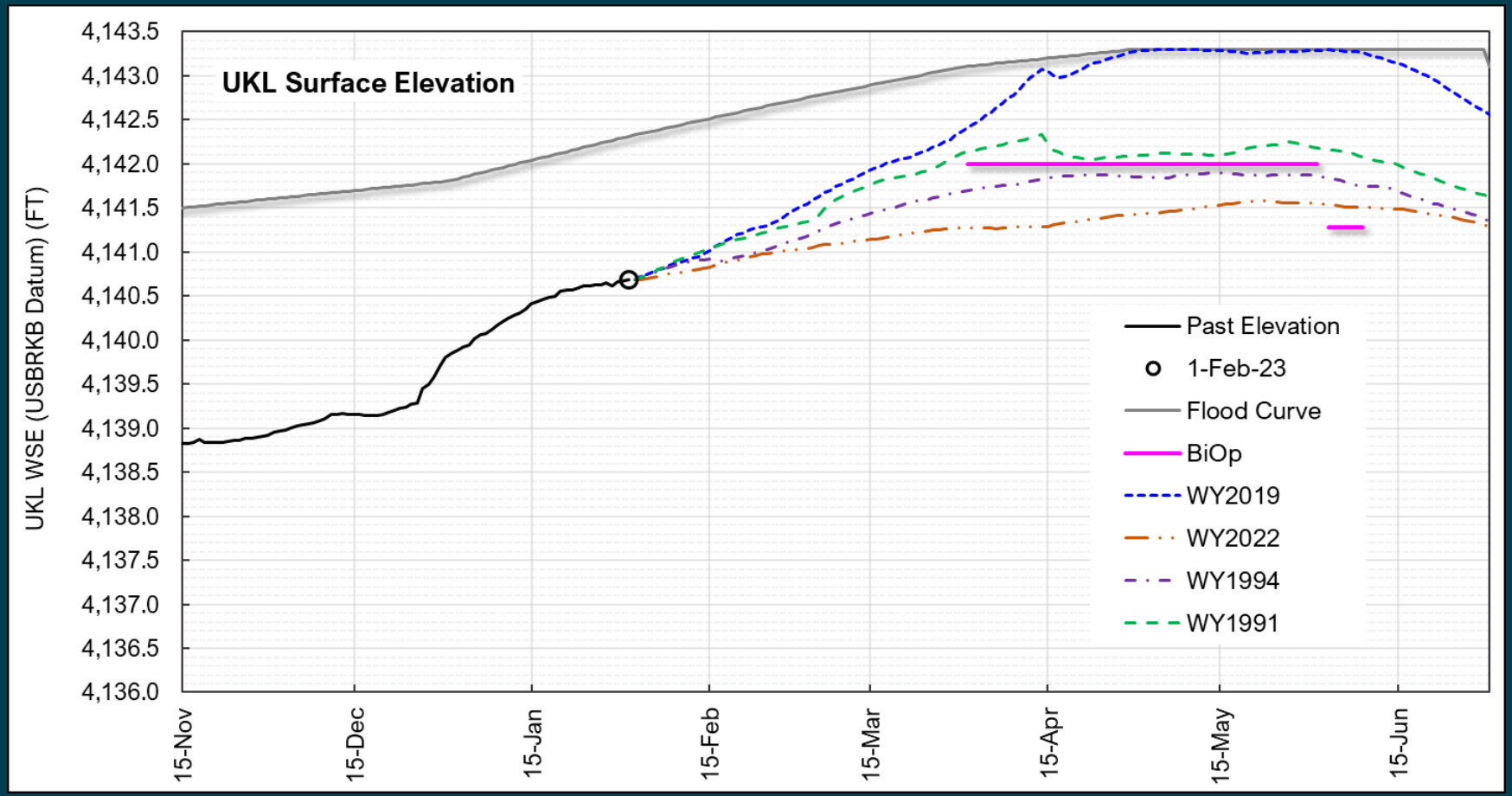
NRCS Upper Klamath Basin Snow Water Equivalent (SWE) Water Year 2023 & Nearest Neighboring Water Years for Net Inflow-to-date



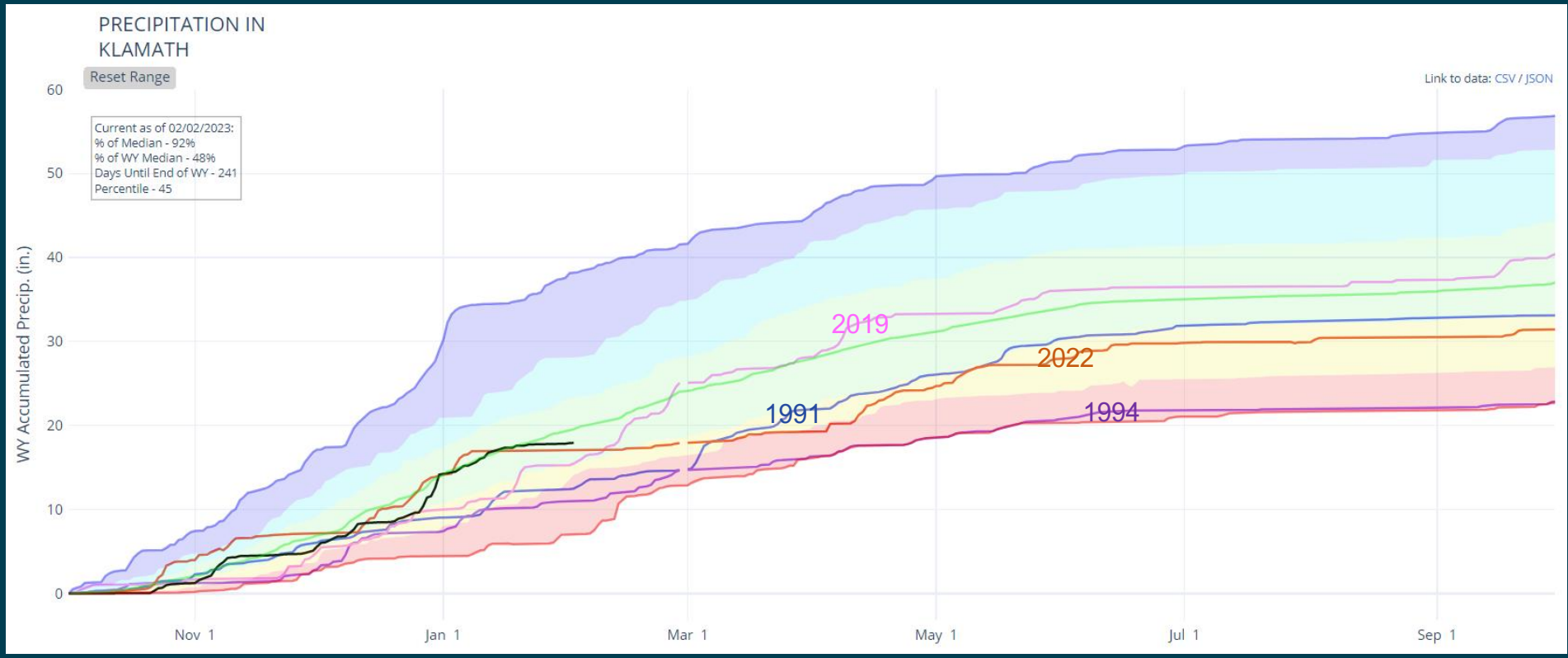
Statistical shading breaks at the 10th, 30th, 50th, 70th, and 90th percentiles

https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assocHUC6/180102_Klamath.html

UKL Surface Elevation
Nearest Neighboring Water Years for Net Inflows to-Date



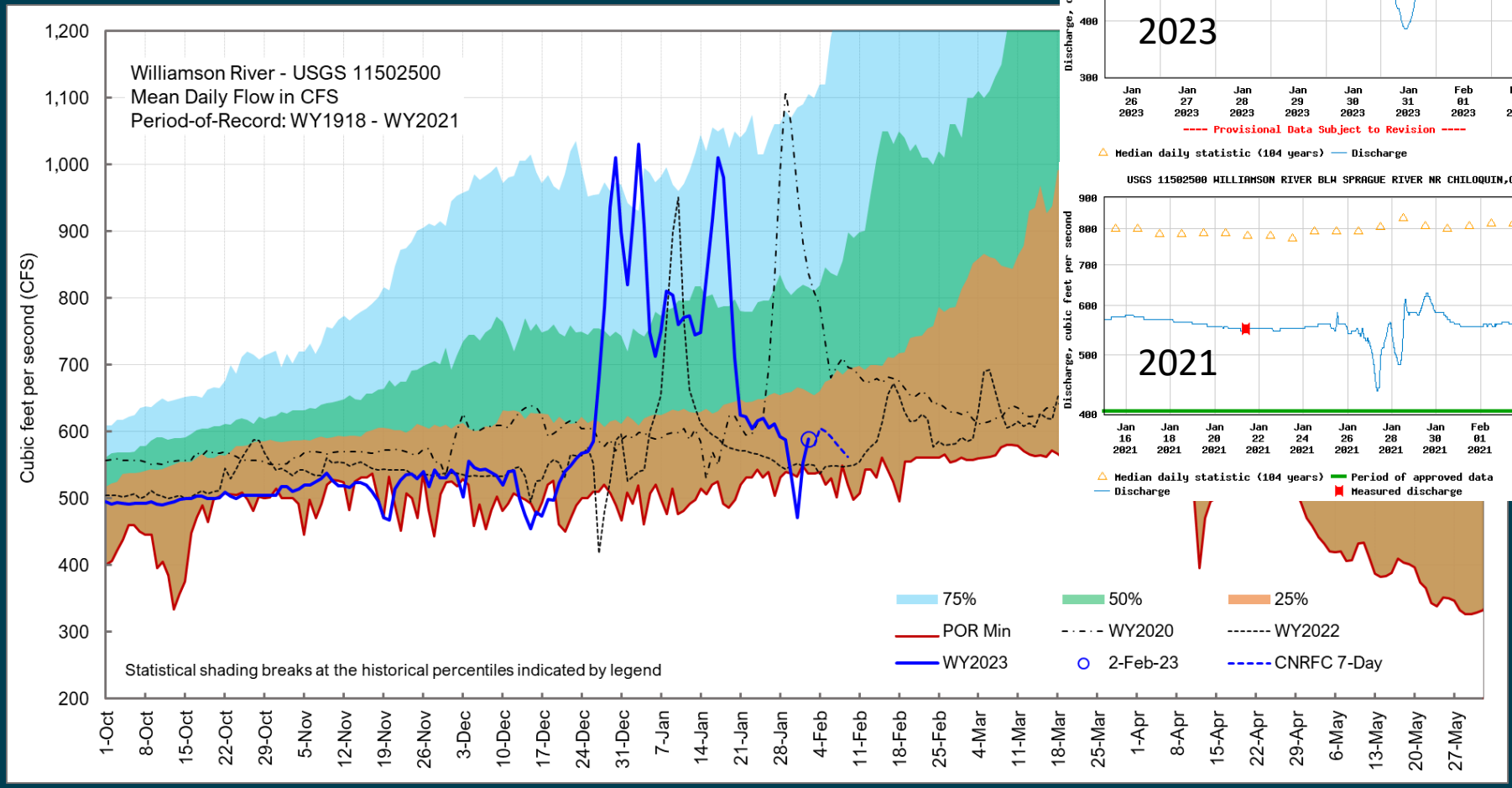
Upper Klamath Basin Precipitation - NRCS Water Year 2023

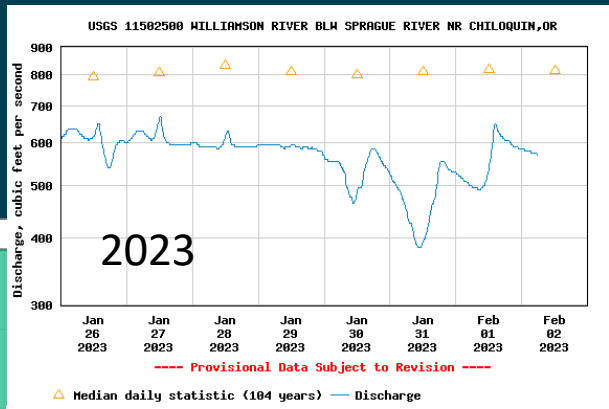


Statistical shading breaks at 10th, 30th, 50th, and 90th Percentiles
WY2023 displayed as black trace

https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/PREC/assocHUC6/180102_Klamath.html

Williamson River - USGS 11502500





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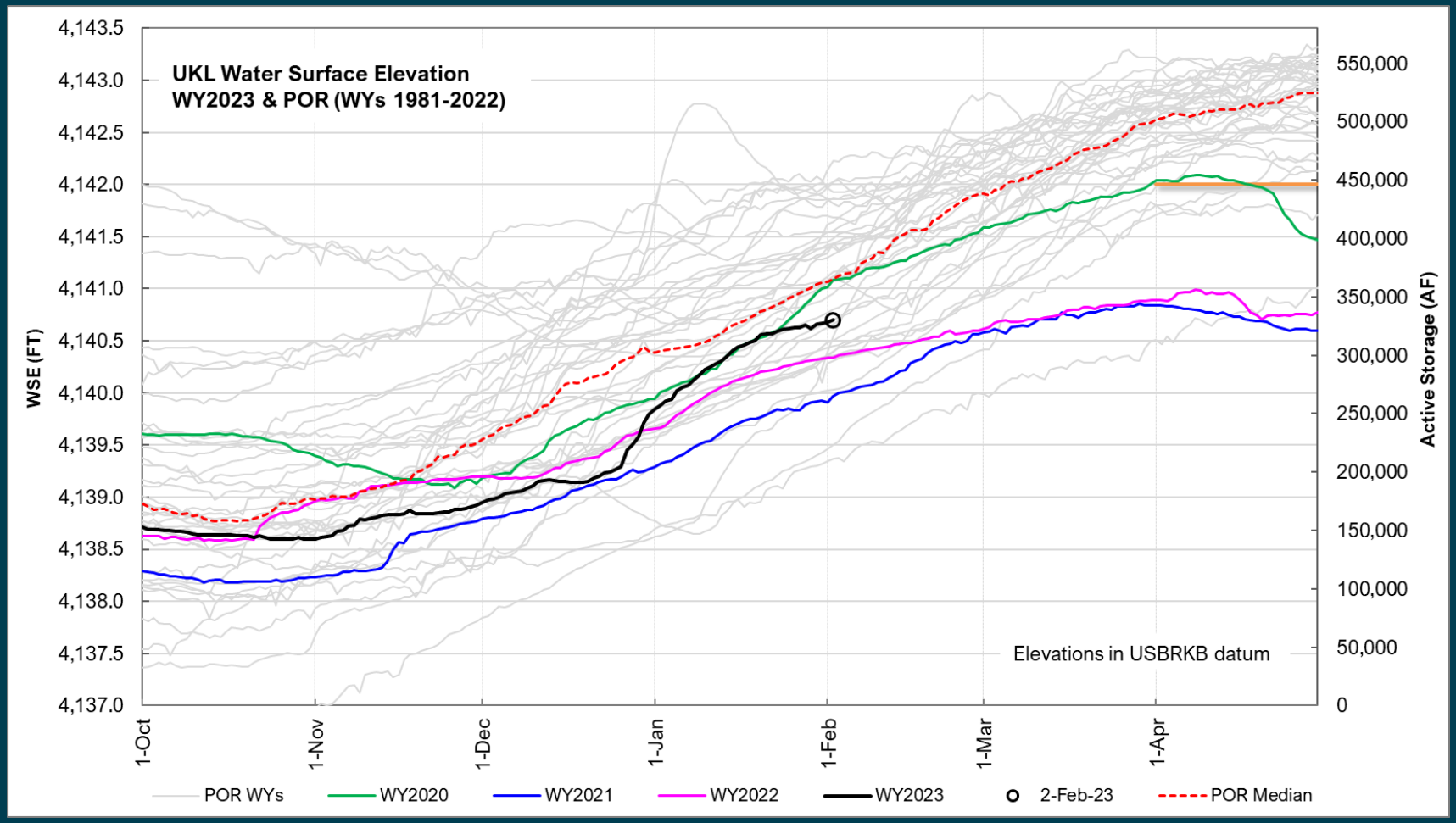
UKL Water Surface Elevation
Water Year 2023 & Period-of-Record-to-Date

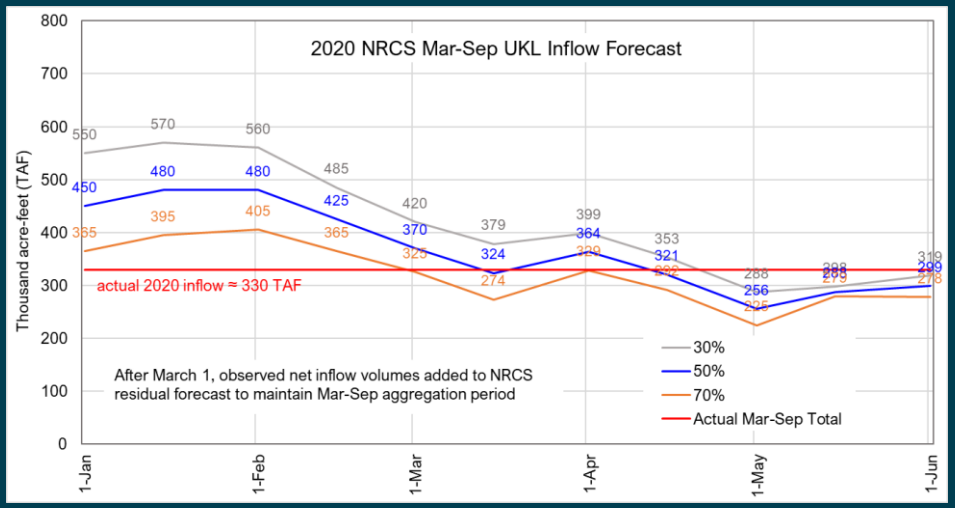


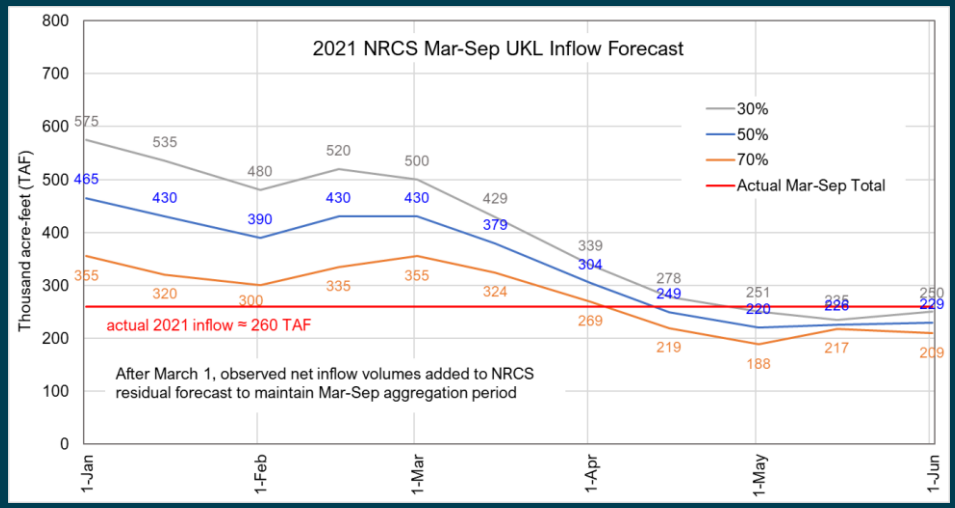
WY2022/2023 UKL water surface elevation observational data are provisional

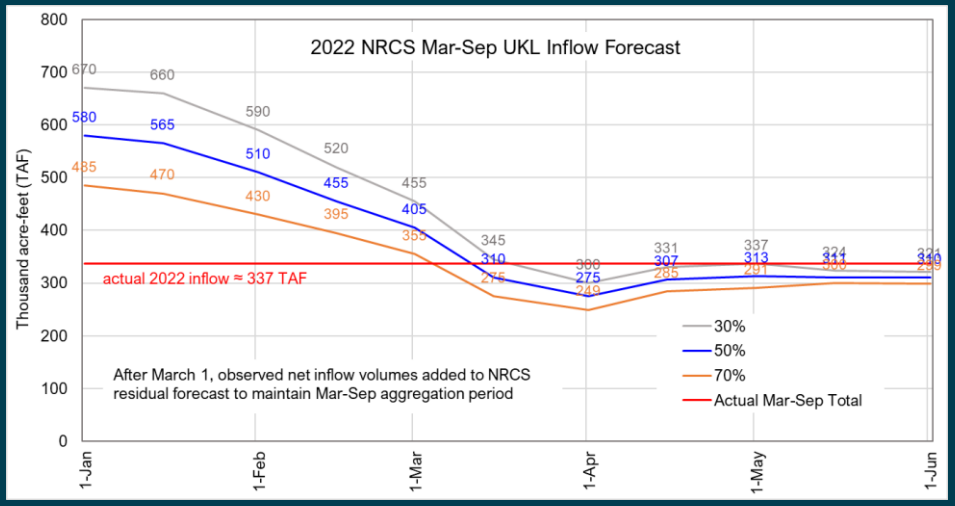
Redd Survey Locations

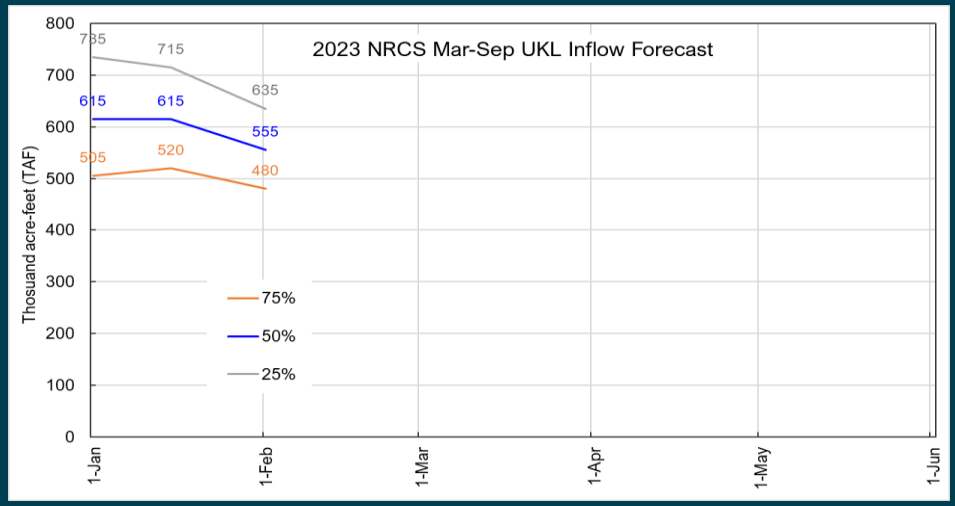
Long-Term Upper Klamath Lake Inflow and Operations Forecasts

NRCS Klamath River Basin Water Supply Forecast
Last Three Water Years – March-September

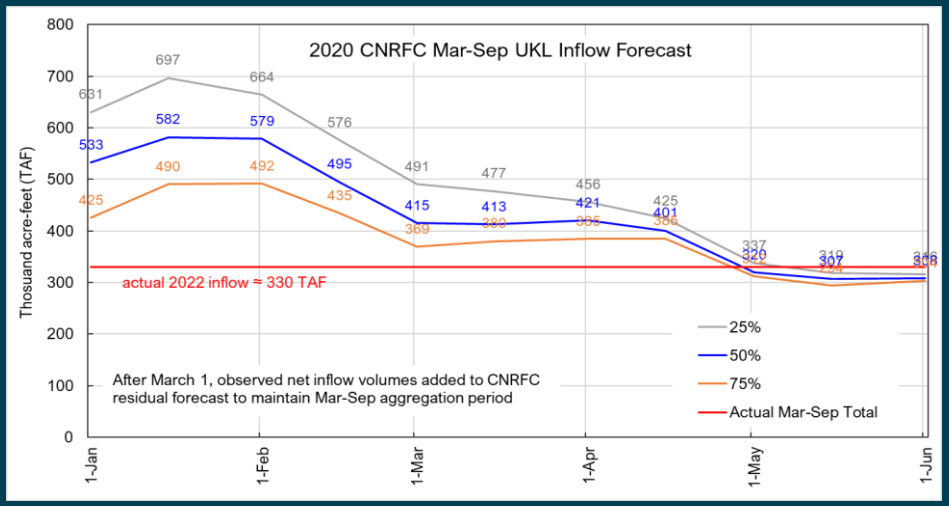


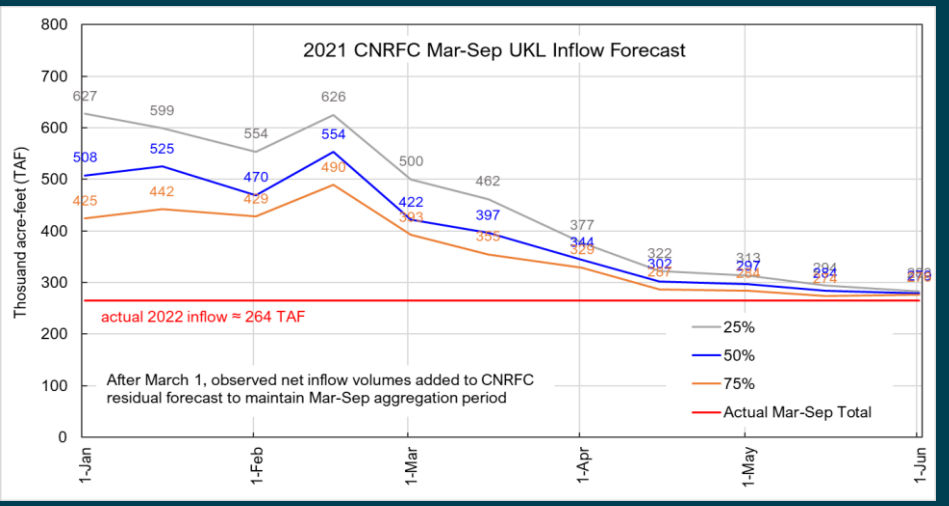


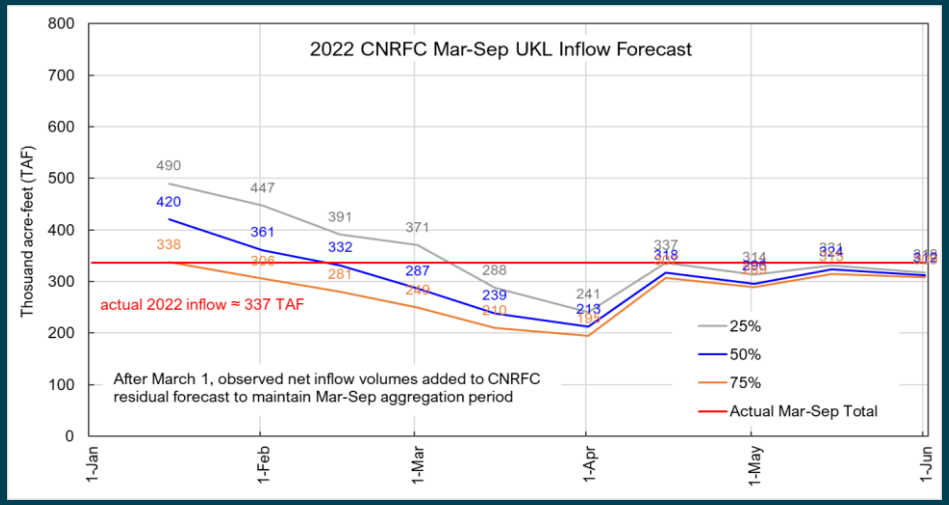


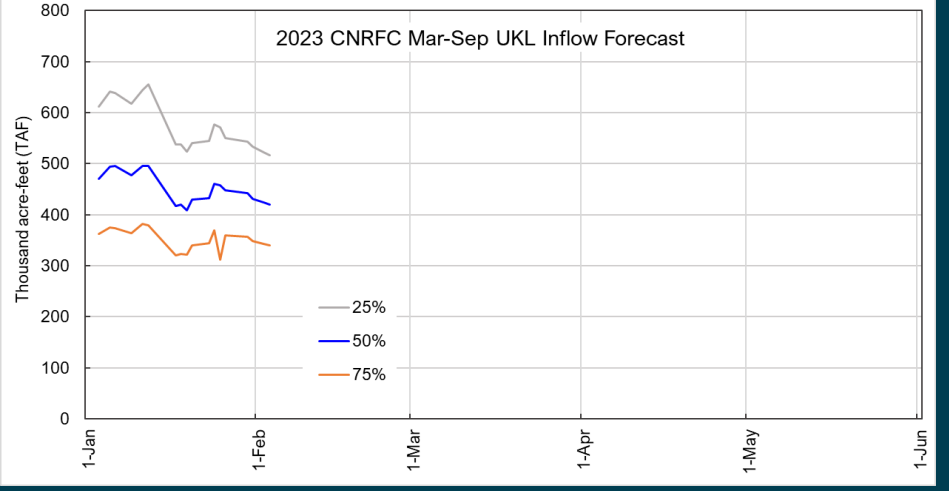


CNRFC Klamath River Basin Water Supply Forecast
Last Three Water Years – March-September

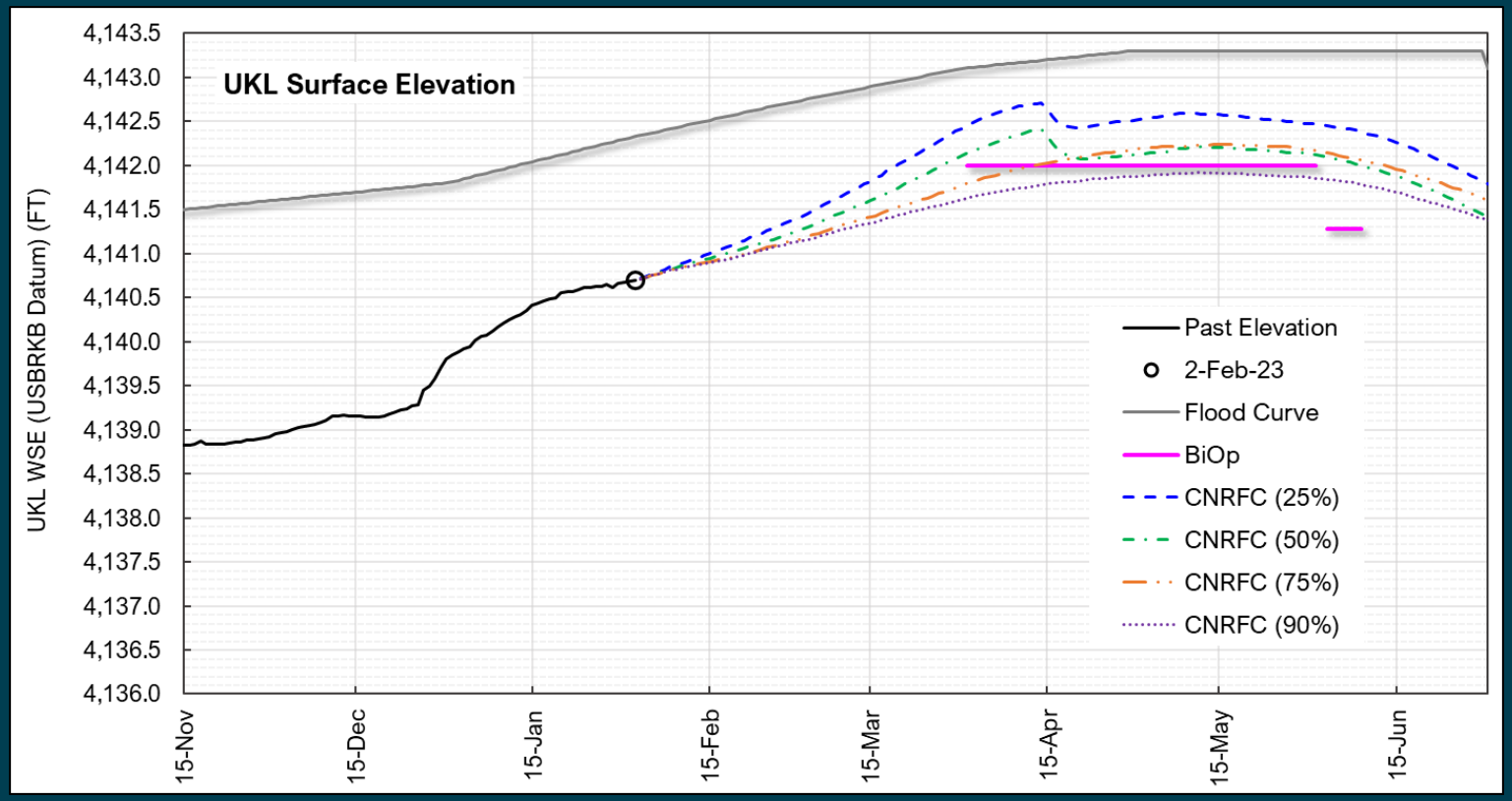








UKL Water Surface Elevation – CNRFC Upper Klamath Lake Net Inflow (UKLNI) Forecast



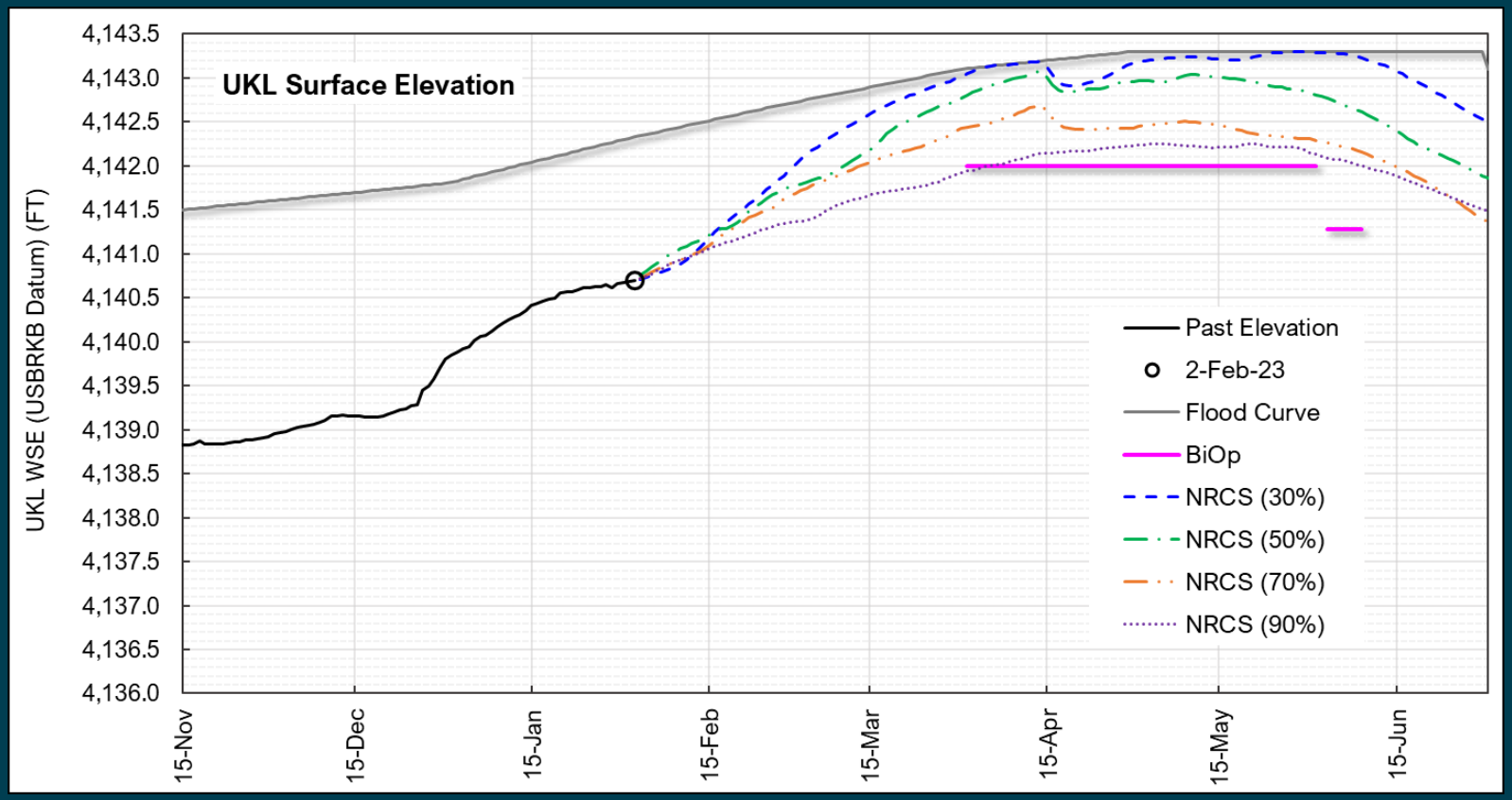
Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

CNRFC UKL monthly probability net inflow forecast volumes at 25%, 50%, 75% and 90% probability of exceedance (POE) levels used in ensemble

Ag diversions switched off through May for 75% and 90% POE scenarios; LKNWR deliveries switched off through Feb for 75% and 90% POE scenarios

No SFF if below 4142.00 on Apr 1

UKL Water Surface Elevation – NRCS Feb 1 Klamath River Basin (KRB) Water Supply Forecast (WSF)

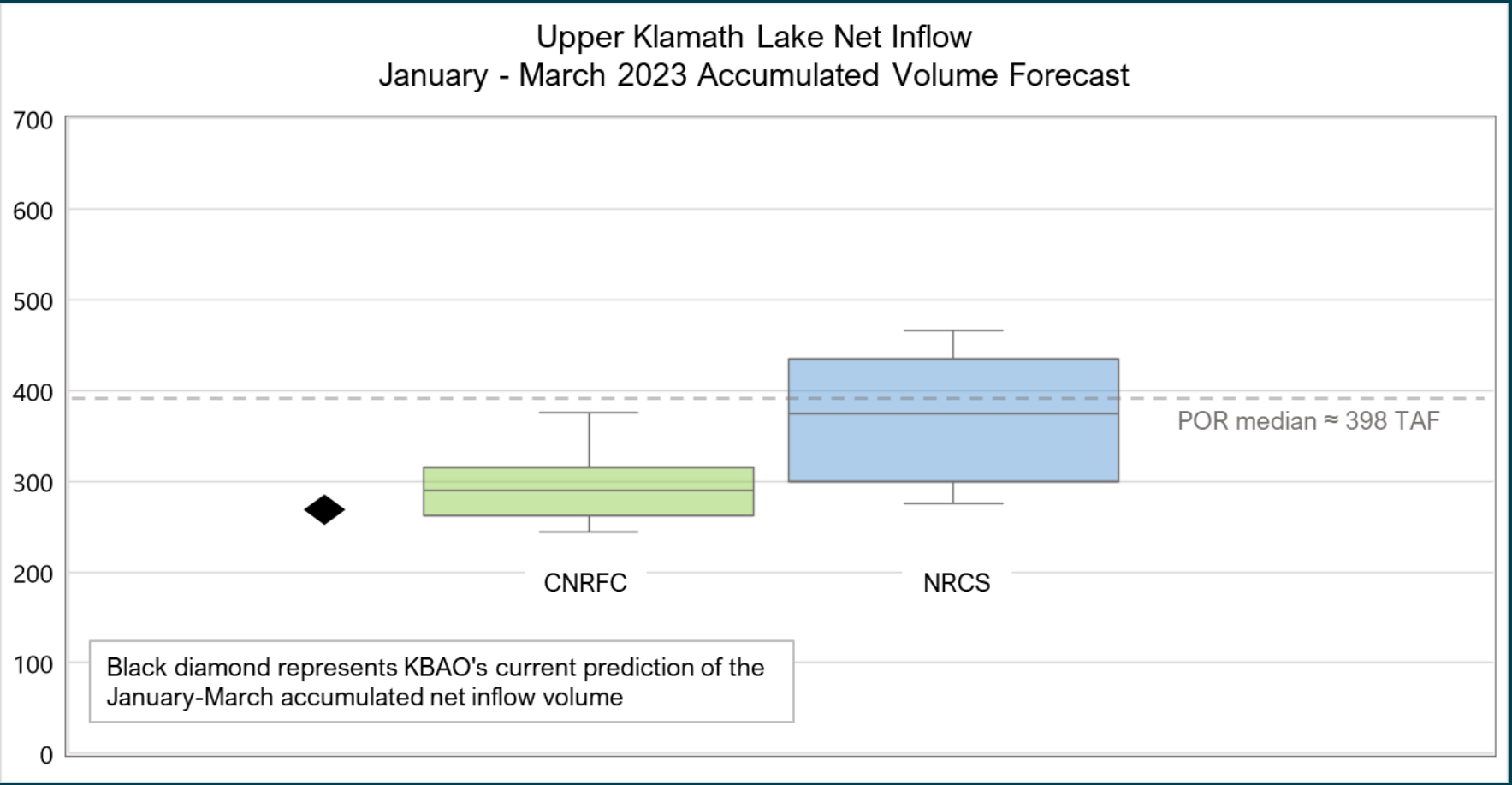


Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

NRCS Feb 1 KRB WSF UKLNI forecast volumes at 30%, 50%, 70% and 90% probability of exceedance (POE) levels used in ensemble

WY2023 observed UKL water surface elevation data are provisional

January 2023 Accumulated Net Inflow Forecast
CNRFC & NRCS



Assumptions, Model Input, Basis of Planning

- January 1 – March 31 UKL net inflow volume ≈ 265 TAF

UKL Net Inflow			
TAF	WY2020	WY2021	WY2022
Jan-Mar	260.9	228.7	207.3

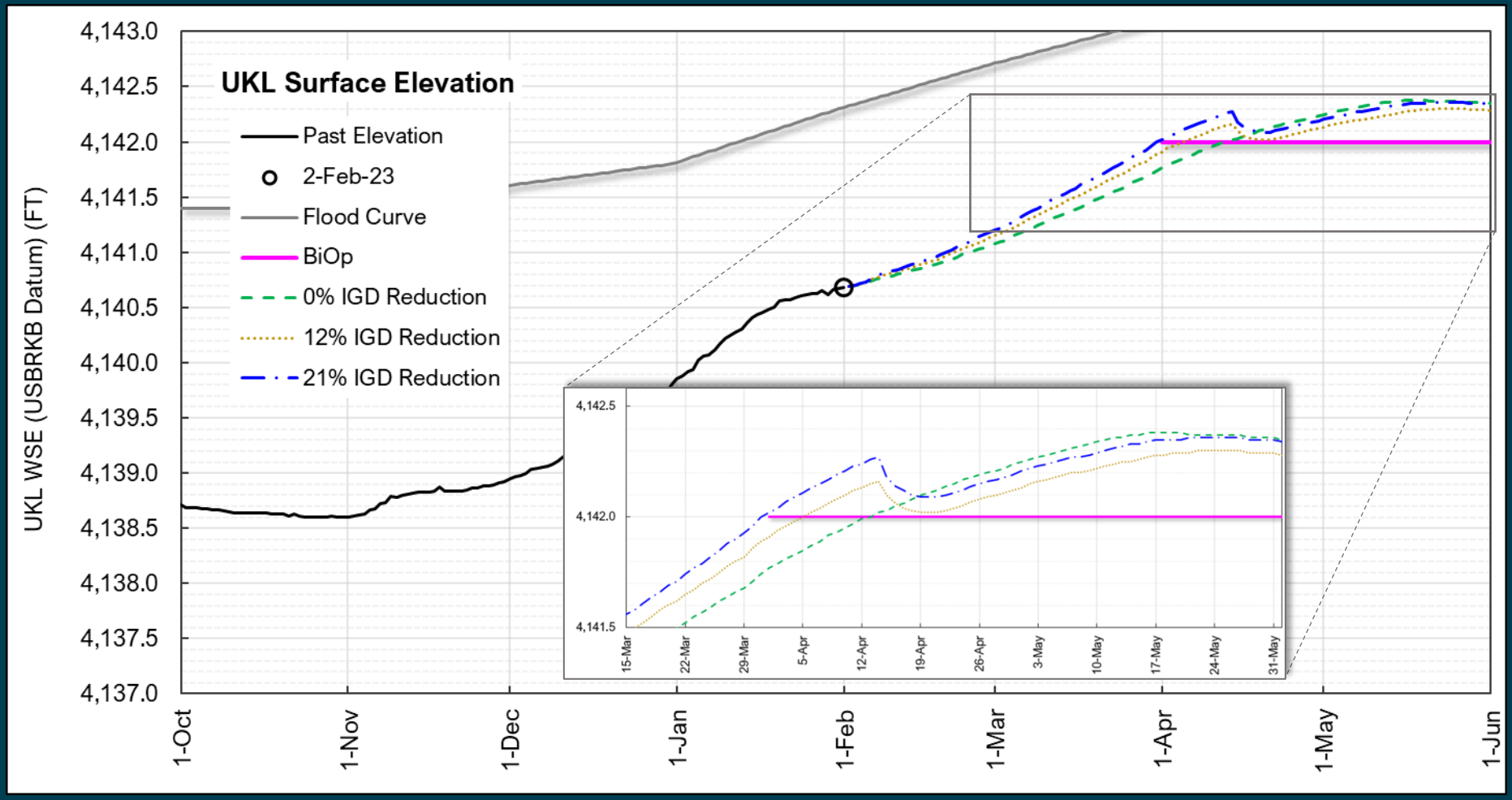
- January 1 – April 31 UKL KIG accretion volume ≈ 102 TAF
- January 1 – March 31 Lake Ewauna accretion volume ≈ 4 TAF
- LKNWR deliveries switched off from January 27 through February
- Project diversions switched off through March
- Analysis of analog year trends that includes but is not limited to the following WYs:
  - WYs 2022, 2021, 2020, 2018, 2010, 2009, 2005, 1991, 1981

Temporary Operation Procedures

Reclamation Assessment

- For the purpose of the TOP at this time, Reclamation intends to balance risk between the ESA requirements by planning for a net inflow to UKL of approximately 265 TAF between Jan 1 and Apr 1.
- Reclamation's Technical Proposal is:
  - Reduction of 21% in minimum flows at Iron Gate Dam beginning on February 8 in order to exceed 4142.0 feet and provide an estimated 6,030 cfs flushing flow for one day in mid-April.
  - Perform additional monitoring after Feb 8 to assess effects of flow reductions and the potential effects of further changes, if contemplated
  - Continue weekly adaptive management measures to adjust to information on hydrologic and biological conditions, as it becomes available

UKL Water Surface Elevation – TOP



Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed UKL water surface elevation data are provisional

UKL Water Surface Elevation – TOP

% IGD Reduction	Projected Apr 1 UKL elev (FT)	Average IGD Release, MDF (CFS)	SFF, Day 1 magnitude (CFS)	SFF, Day 2/3 magnitude (CFS)
0	4141.77	BiOp	NA	NA
12	4141.91	860	5000	rampdown
21	4142.02	773	6030	rampdown

Projections, including WY2023 target elevations and surface elevation trajectories, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

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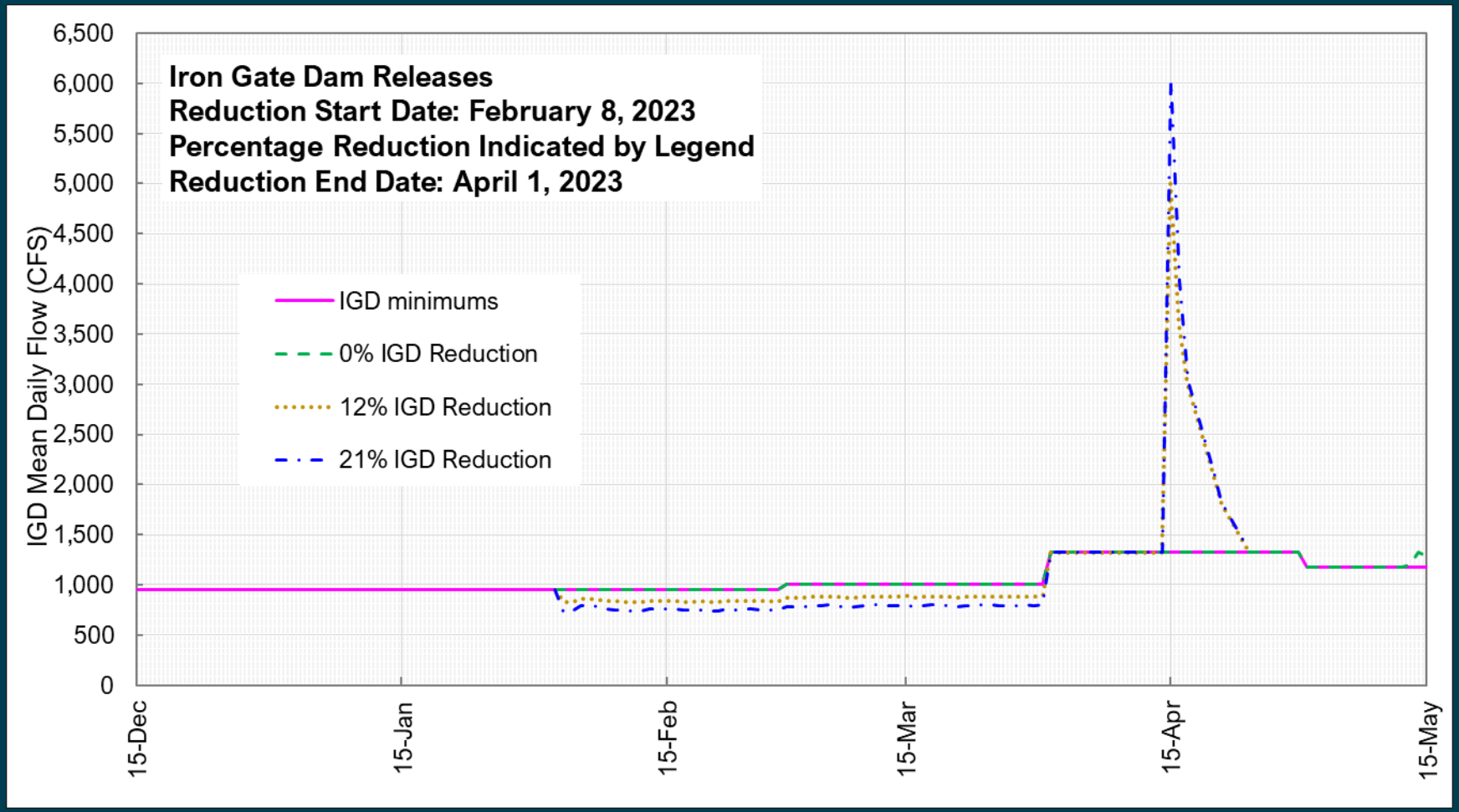
Iron Gate Dam Releases – TOP



Projections, including IGD releases, are provisional and subject to revision based on future water supply forecasts, hydrologic conditions, and operational decisions

WY2023 observed IGD release data are provisional

Estimated River Habitat Spawning Reductions – 950 cfs

Q (cfs)	Q Red.	Habitat Red.	Pct. Hab. Tot.
950	-	-	85%
855	10%	6%	80%
760	20%	12%	75%
665	30%	21%	67%
570	40%	53%	40%

Based on Response to Reclamation Request for Technical Assistance from USFWS

Estimated River Habitat Rearing Reductions – 950 cfs

Q (cfs)	Q Red.	Habitat Red.	Pct. Hab. Pot.
950	-	-	45%
855	10%	6%	42%
760	20%	13%	39%
665	30%	17%	37%
570	40%	43%	26%

Based on Response to Reclamation Request for Technical Assistance from USFWS

Estimated River Habitat Rearing Reductions – 1000 cfs

Q	Q Red.	Habitat Red.	Pct. Hab. Pot.
1000	-	-	46%
900	10%	5%	43%
800	20%	11%	40%
700	30%	17%	38%
600	40%	20%	36%

Based on Response to Reclamation Request for Technical Assistance from USFWS

Technical Input Requests

Reclamation is seeking input on the following technical topics:

- The stated objective of reaching 4,142.4 feet in Upper Klamath Lake by April 1, as a means of balancing risks to all ESA species
- The assessment of what the likely conditions on April 1 will be, based on available information
- The timing and magnitude of reductions to minimum flows that would minimize risks to salmon, as it relates to attaining 4,142.4 in
  Upper Klamath Lake by April 1

Proposed Schedule

Jan 26 – Finalization of Temporary Operating Procedures

Feb 07 – Nation to Nation meeting with the Department of the Interior

Feb 08 – First day of potential flow changes to Iron Gate Dam releases

Thru Apr 1 – weekly FASTA to discuss and adjust the TOP, to achieve and remain above 4,142.00 ft. on UKL in April and May

Technical Input Requests

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- The stated objective of reaching 4,142.4 feet in Upper Klamath Lake by April 1, as a means of balancing risks to all ESA species
- The assessment of what the likely conditions on April 1 will be, based on available information
- The timing and magnitude of reductions to minimum flows that would minimize risks to salmon, as it relates to attaining 4,142.4 in Upper Klamath Lake by April 1

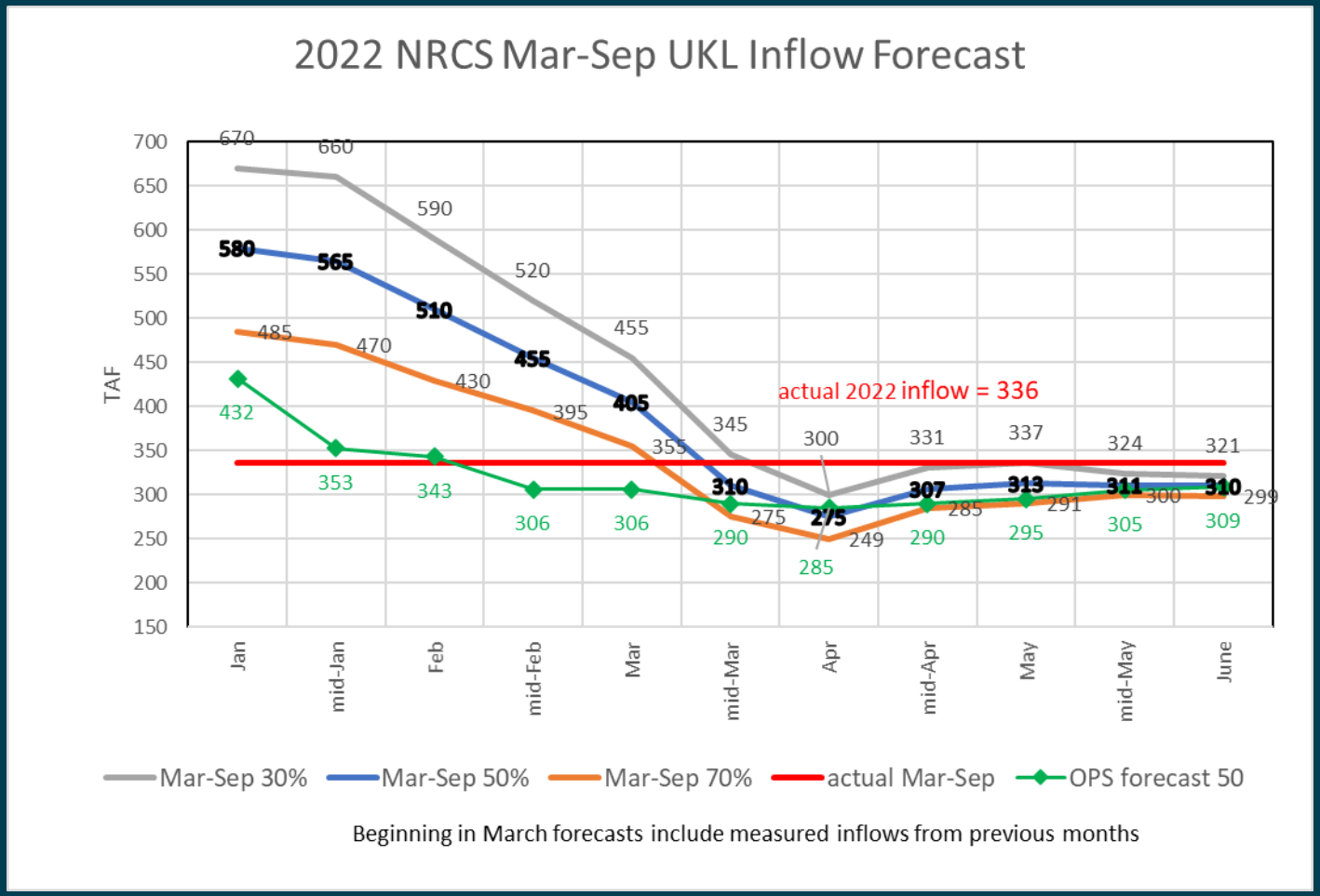
Technical Input

- **Please submit comments, to Courtney Mathews, cmathews@usbr.gov**

- **Updates and materials can be found at** www.usbr.gov/mp/kbao

Supplemental Information

2022 NRCS vs. KBAO estimates of UKL inflow



NRCS Upper Klamath Basin Snow/Precipitation Report WY2023

Upper Klamath Basin SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

Data based on the first reading of the day (typically 00:00) for Friday, February 03, 2023

Basin Site Name	Elev (ft)	Snow Water Equivalent			Water Year-to-Date Precipitation		
		Current (in)	Median (in)	Pct of Median	Current (in)	Median (in)	Pct of Median
KLAMATH							
Fish Lk.	4660	4.7	7.2	65	19.9	23.4	85
Chemult Alternate	4850	9.9	6.5	152	13.7	14.2	96
Gerber Reservoir	4890	1.7	1.4(22)	121	7.9	7.0(22)	113
Taylor Butte	5030	7.0	5.5	127	10.5	10.3	102
Crowder Flat	5170	4.0	2.7(21)	148	8.6	7.6(21)	113
Billie Creek Divide	5280	14.2	13.2	108	24.6	28.5	86
Diamond Lake	5280	5.3	9.9	54	21.5	26.4	81
Sun Pass	5400	15.2	13.0(14)	117	19.8	20.6(14)	96
Sevenmile Marsh	5700	19.2	17.8	108	30.8	35.6	87
Quartz Mountain	5720	4.3	1.3(27)	331	10.0	7.6(17)	132
Silver Creek	5740	8.6	7.6	113	12.1	12.9	94
Strawberry	5770	6.8	3.7	184	11.2	10.2	110
Cold Springs Camp	5940	14.5	19.4	75	18.2	31.6	58
Fourmile Lake	5970	14.2	17.3	82	24.8	30.4	82
Annie Springs	6010	27.5	22.7(20)	121	32.0	34.6(20)	92
Crazyman Flat	6180	13.1	10.5(19)	125	14.2	16.3(19)	87
Swan Lake Mtn	6830	19.7	14.4(14)	137	22.0	17.2(14)	128
Summer Rim	7080	7.5	11.0	68	10.1	13.0	78
Basin Index (%)				**107**			**90**

-M = Missing data.
* = Analysis may not provide a valid measure of conditions.
N/A = Not available.

Footnotes for median and average:
(##) = If less than 30 years are available, this value specifies the number of years used for the median and average calculations. Sites with less than 10 years available do not have medians or averages.

The MONTH-TO-DATE PRECIPITATION Percent of Median (or Average) represents the total precipitation (beginning on the 1st day of the current month) found at selected SNOTEL sites in or near the basin compared to the Median (or Average) value for those sites on this day.

The WATER YEAR-TO-DATE-PRECIPITATION represents total precipitation since October 1st, expressed in inches.

Contact your state water supply staff for assistance.

Medians and averages are calculated for the period 1991-2020.

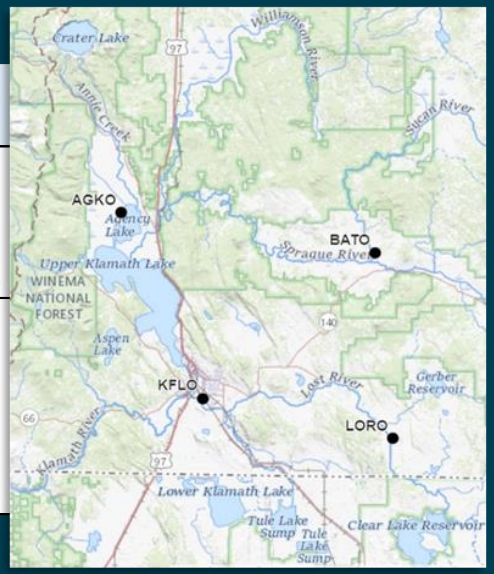
Provisional data, subject to revision.

https://wcc.sc.egov.usda.gov/reports/SelectUpdateReport.html

Klamath Basin AgriMet – USBR
Water Year (WY) 2023

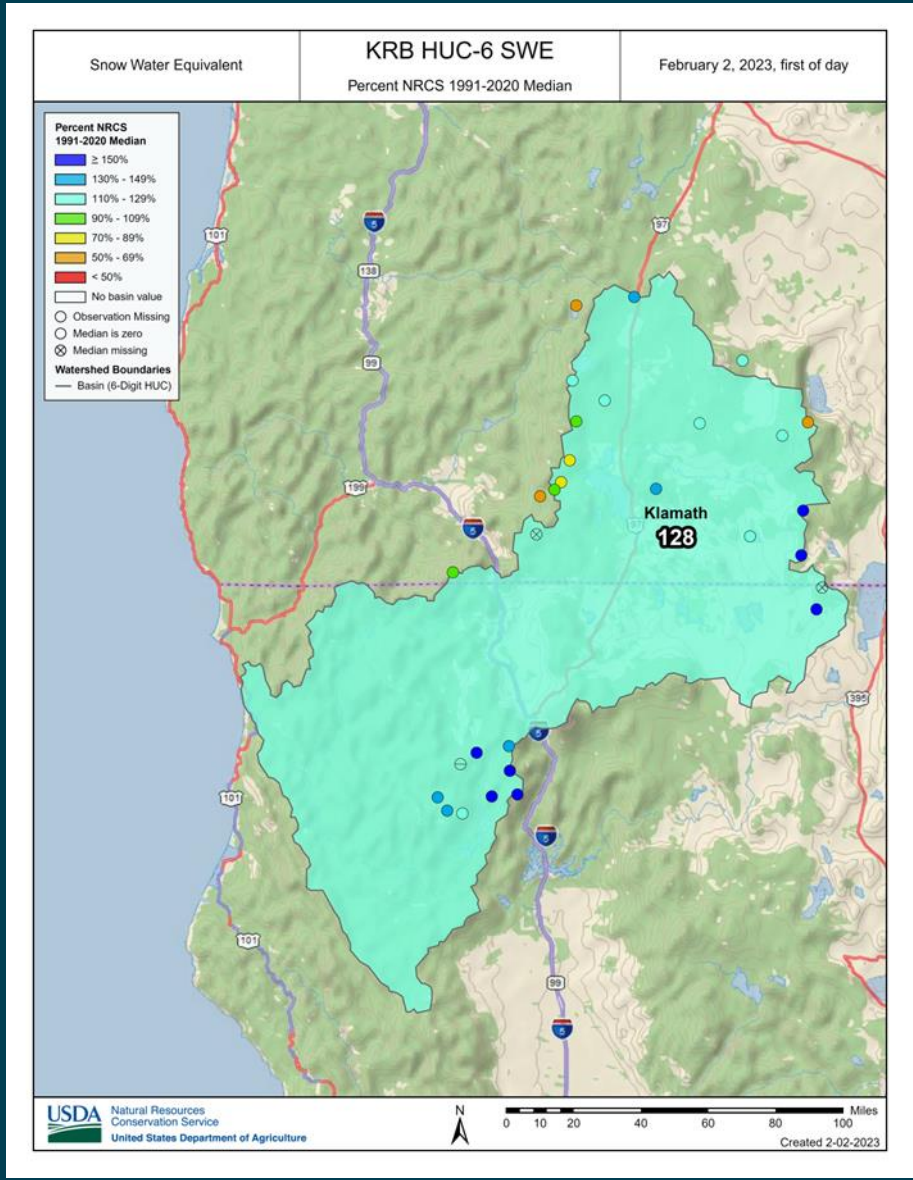
Klamath Basin AgriMet Stations - Water Year-to-date Precipitation (through below date)
Wednesday, February 1, 2023

Station (POR)	WY2023 Total PREC (in.)	POR Median PREC (in.)	Percent POR Median	CBTT	PCODE	SDI	ELEV (ft.)
Lorella (2002-2021)	4.66	5.01	93%	LORO	PU	200586	4159
Beatty (2005-2021)	4.74	4.58	103%	BATO	PU	200522	4319
Agency (2001-2021)	8.34	7.99	104%	AGKO	PU	200542	4149
KFalls (1999-2021)	6.12	5.51	111%	KFLO	PU	200553	4099



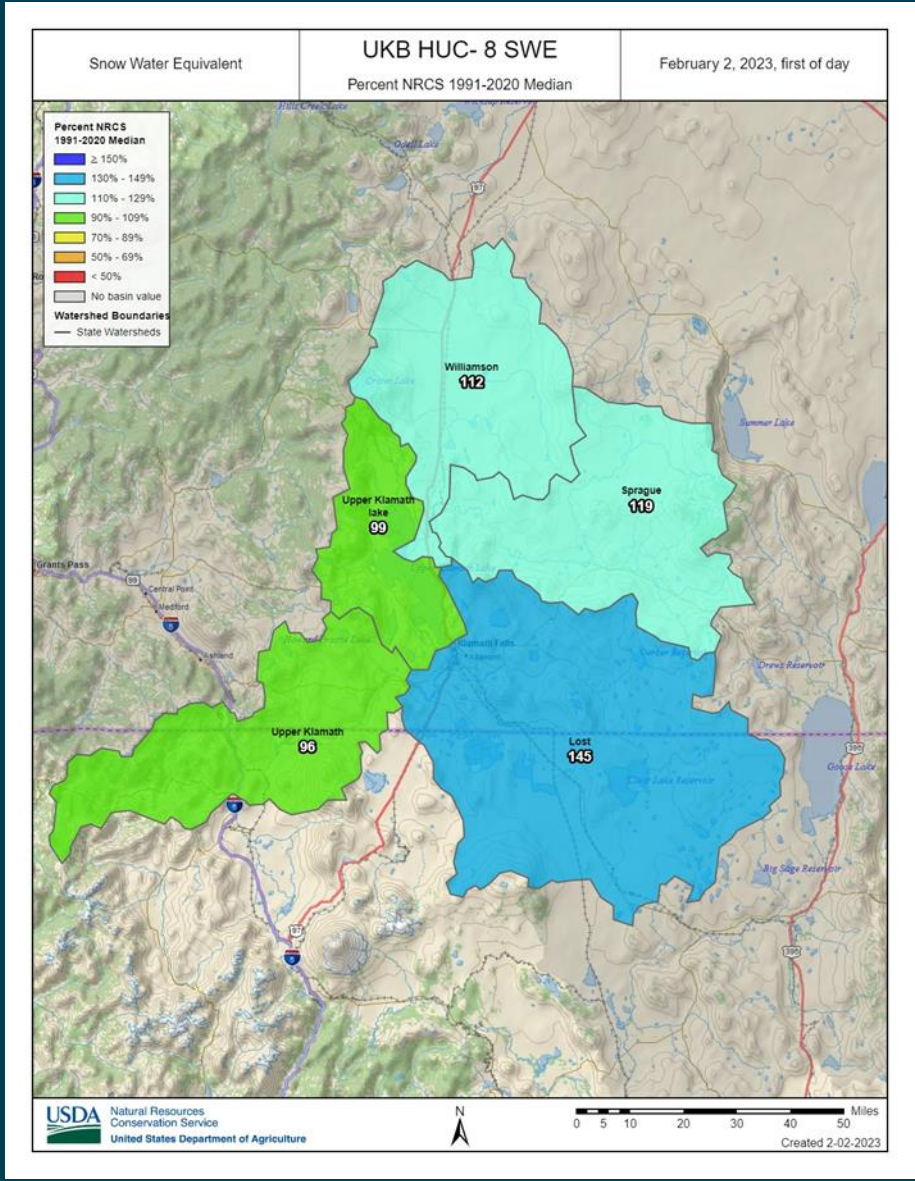
https://www.usbr.gov/lc/region/g4000/riverops/_HdbDataViewer.html?query=svr=kbohdb&sdi=200586%2C200522%2C200542%2C200553&tstp=DY&t1=2021-10-01T00:00&t2=2022-03-01T00:00&table=R&mrid=0&format=json

NRCS Klamath River Basin (KRB) HUC-6 Snow Water Equivalent (SWE) WY2023



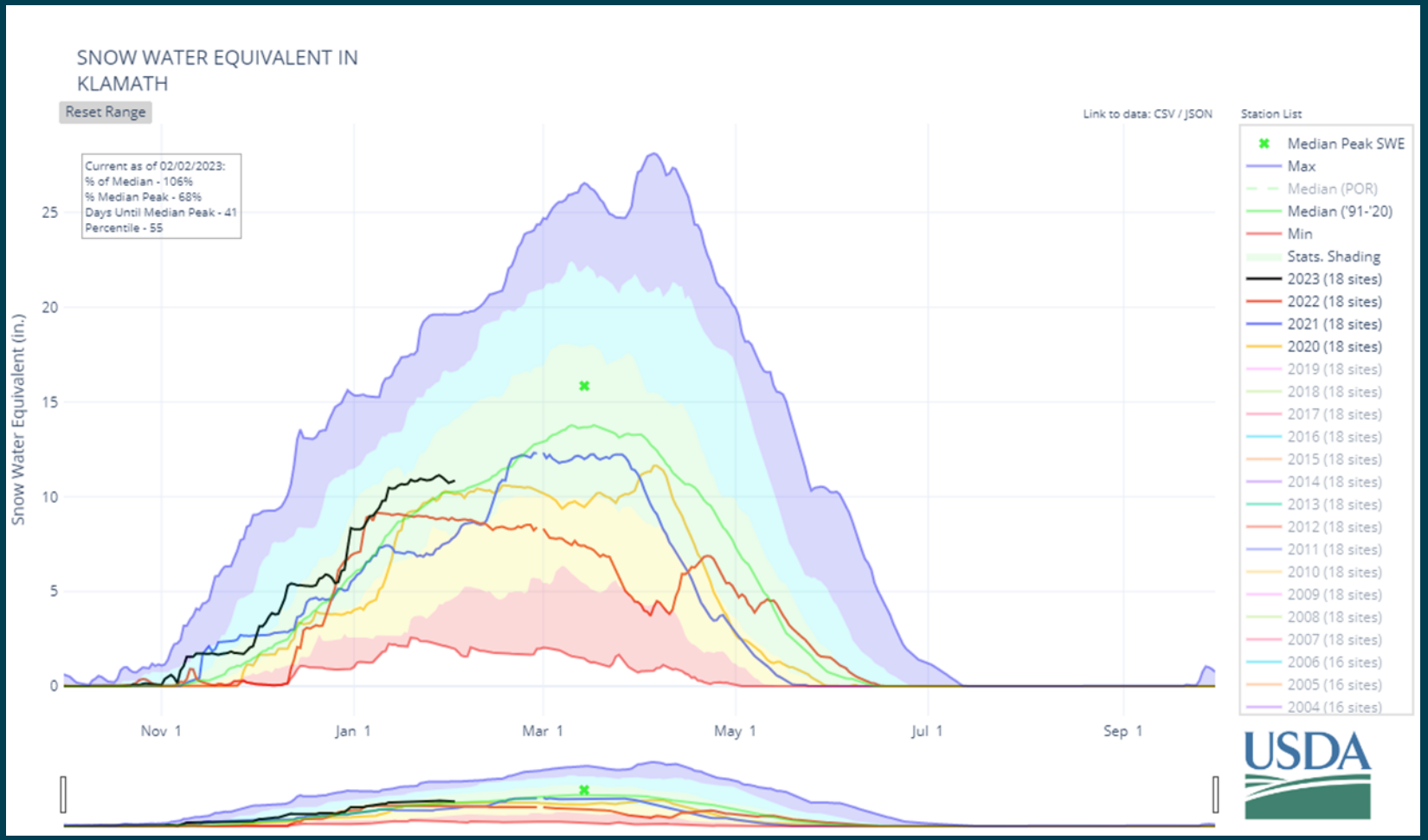
https://www.nrcs.usda.gov/wps/portal/wcc/home/quicklinks/imap

NRCS Upper Klamath Basin (UKB) HUC-8 Snow Water Equivalent (SWE) WY2023



https://www.nrcs.usda.gov/wps/portal/wcc/home/quicklinks/imap

NRCS Upper Klamath Basin Snow Water Equivalent (SWE) WY2023- NRCSWY2023 & Last 3 Water Years



https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assocHUC6/180102_Klamath.html

Klamath Falls Weather Forecast - NWS
02 February 2022

https://forecast.weather.gov/MapClick.php?lat=42.2292&lon=-121.7842#.YbtneahKjIU

Klamath Falls Weather Forecast - NWS
02 February 2022

Detailed Forecast

Today	Mostly sunny, with a high near 49. South southeast wind 10 to 16 mph, with gusts as high as 24 mph.
Tonight	Mostly cloudy, with a low around 31. Breezy, with a southeast wind 13 to 23 mph, with gusts as high as 34 mph.
Friday	Mostly cloudy, with a high near 45. South southwest wind 18 to 21 mph, with gusts as high as 31 mph.
Friday Night	Mostly cloudy, with a low around 30. Southeast wind around 8 mph.
Saturday	Cloudy, with a high near 46. South southeast wind 10 to 18 mph, with gusts as high as 26 mph.
Saturday Night	Rain and snow showers likely, becoming all snow after 1am. Snow level 4200 feet. Mostly cloudy, with a low around 31. Chance of precipitation is 60%. New snow accumulation of less than a half inch possible.
Sunday	Snow showers likely, mainly before 4pm. Mostly cloudy, with a high near 42. Chance of precipitation is 70%. New snow accumulation of less than a half inch possible.
Sunday Night	A chance of snow showers before 10pm. Mostly cloudy, with a low around 28.
Monday	Partly sunny, with a high near 43.
Monday Night	Partly cloudy, with a low around 25.
Tuesday	Mostly sunny, with a high near 46.
Tuesday Night	Partly cloudy, with a low around 26.
Wednesday	Partly sunny, with a high near 45.

https://forecast.weather.gov/MapClick.php?lat=42.2292&lon=-121.7842#.YbtneahKjIU

Orleans Weather Forecast - NWS
02 February 2022

https://forecast.weather.gov/MapClick.php?lat=41.3026&lon=-123.538#.Ybtn56hKjIU

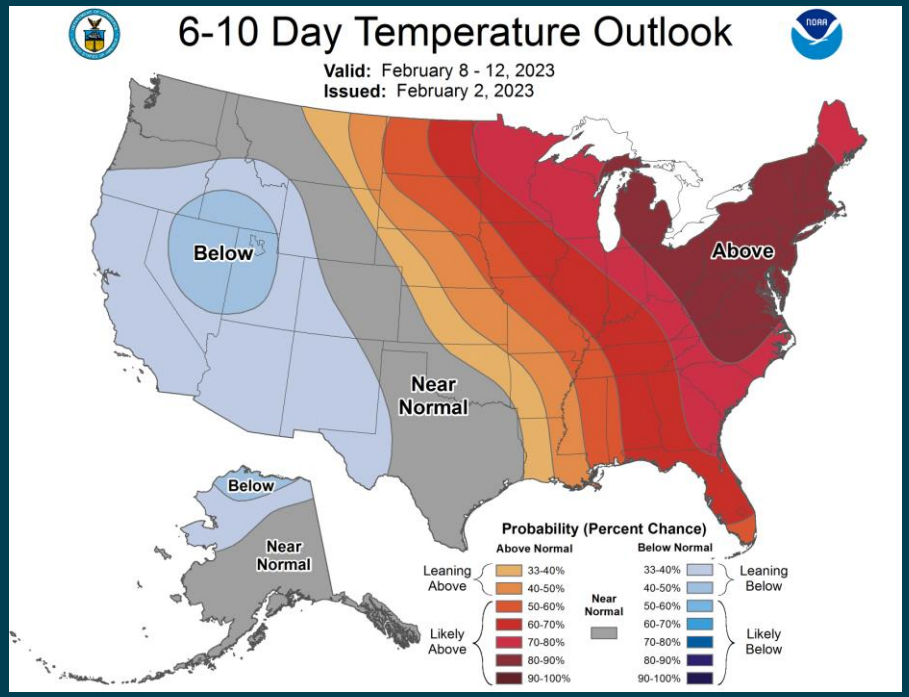
Orleans Weather Forecast - NWS
02 February 2022

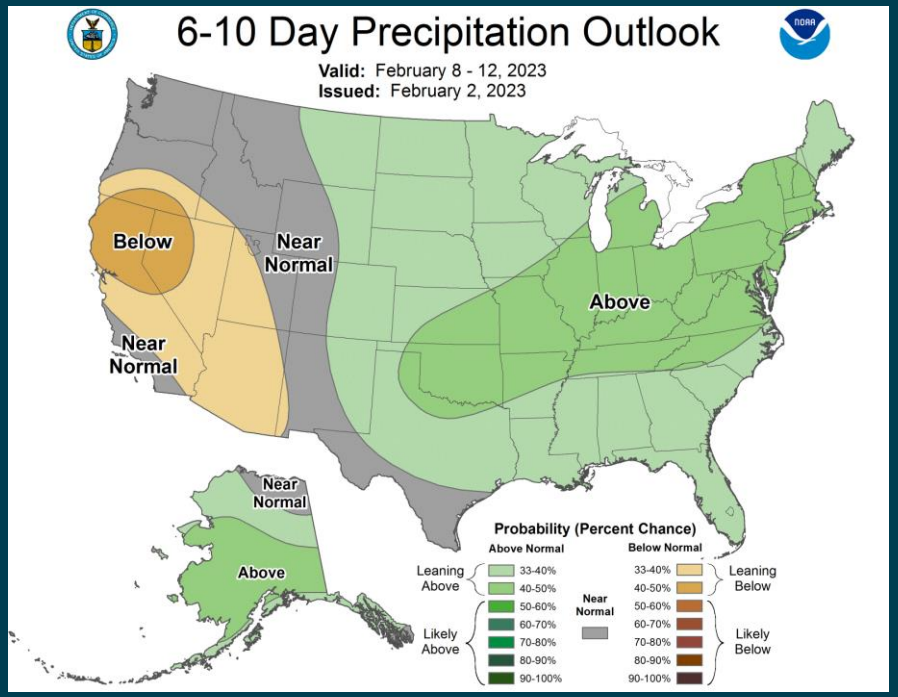
Detailed Forecast

Today	Partly sunny, with a high near 58. Calm wind becoming west southwest 5 to 7 mph in the afternoon.
Tonight	Rain likely after 10pm. Mostly cloudy, with a low around 41. West southwest wind 5 to 7 mph becoming north in the evening. Chance of precipitation is 70%. New precipitation amounts of less than a tenth of an inch possible.
Friday	Rain likely, mainly before 10am. Mostly cloudy, with a high near 50. Light and variable wind becoming southwest 8 to 13 mph in the afternoon. Winds could gust as high as 18 mph. Chance of precipitation is 70%. New precipitation amounts between a tenth and quarter of an inch possible.
Friday Night	Mostly cloudy, with a low around 43. Northwest wind 3 to 5 mph.
Saturday	A 20 percent chance of rain after 10am. Mostly cloudy, with a high near 54. South southeast wind 6 to 10 mph.
Saturday Night	Showers. Low around 42. South wind around 10 mph. Chance of precipitation is 100%. New precipitation amounts between a quarter and half of an inch possible.
Sunday	Showers, mainly before 4pm. High near 45. Chance of precipitation is 90%. New precipitation amounts between a half and three quarters of an inch possible.
Sunday Night	A chance of showers before 10pm. Mostly cloudy, with a low around 38.
Monday	Mostly sunny, with a high near 52.
Monday Night	Partly cloudy, with a low around 38.
Tuesday	A slight chance of rain. Mostly sunny, with a high near 57.
Tuesday Night	A slight chance of rain. Partly cloudy, with a low around 39.
Wednesday	A slight chance of rain. Partly sunny, with a high near 55.

https://forecast.weather.gov/MapClick.php?lat=41.3026&lon=-123.538#.Ybtn56hKjIU

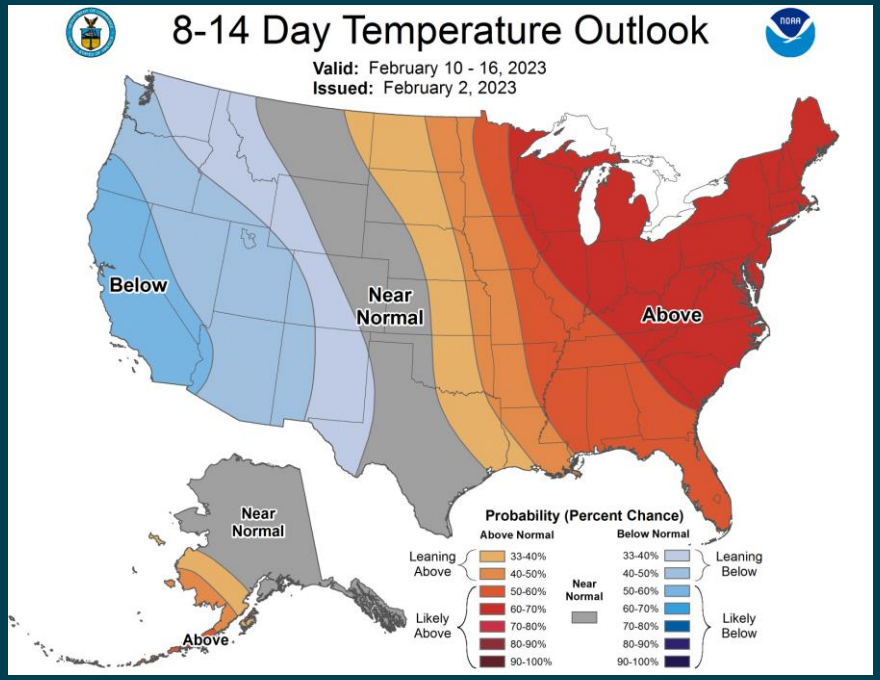
6-10 Day Weather Outlook

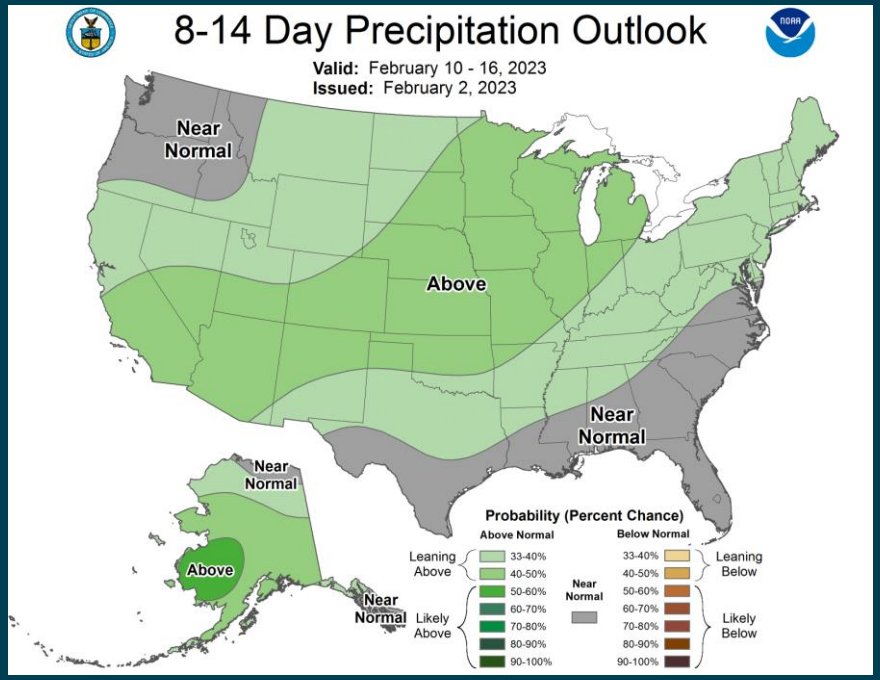




https://www.cpc.ncep.noaa.gov/products/predictions/610day/

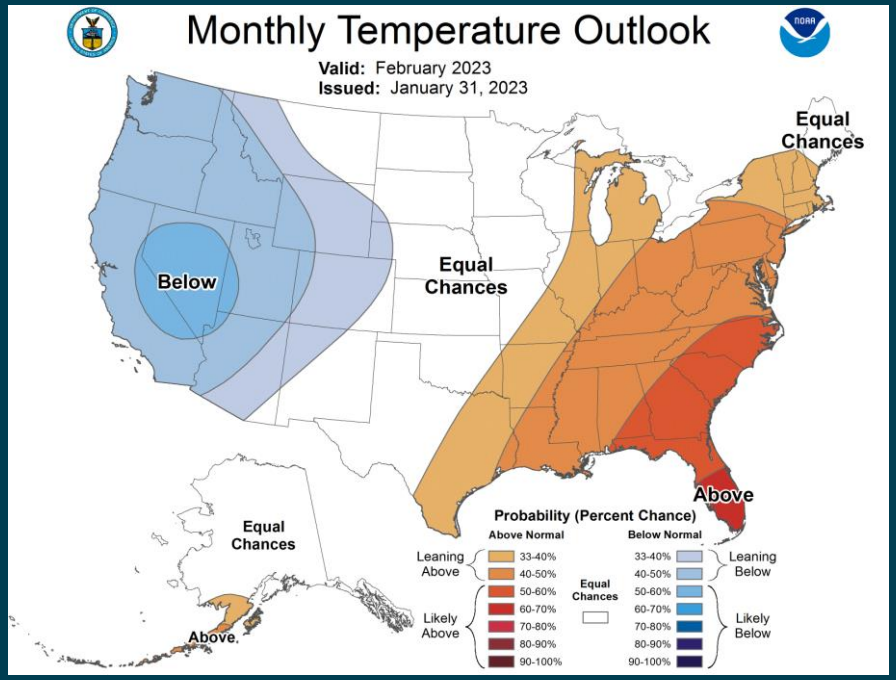
8-14 Day Weather Outlook

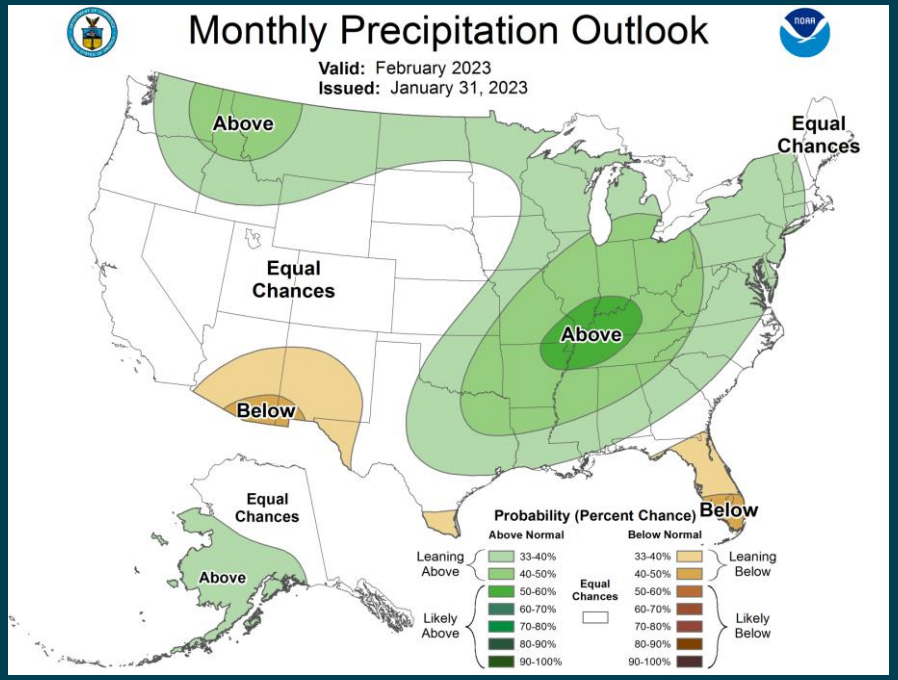




https://www.cpc.ncep.noaa.gov/products/predictions/814day/

February Weather Outlook

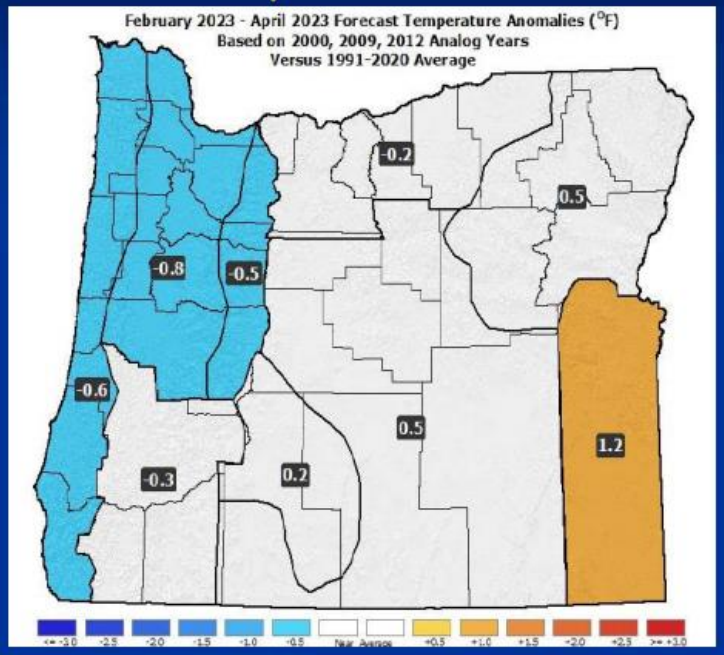




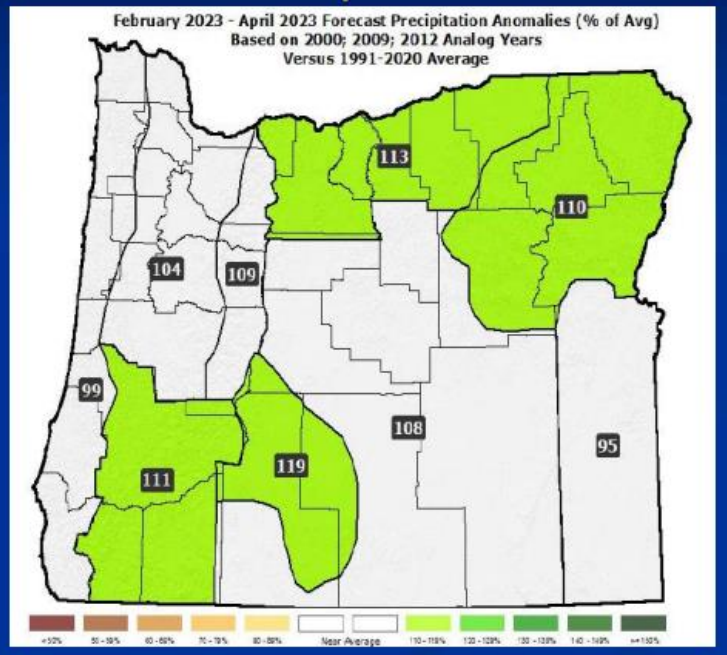
https://www.cpc.ncep.noaa.gov/products/predictions/30day/

Seasonal Climate Forecast - ODA
Feb 2023 – Apr 2023

Temperatures



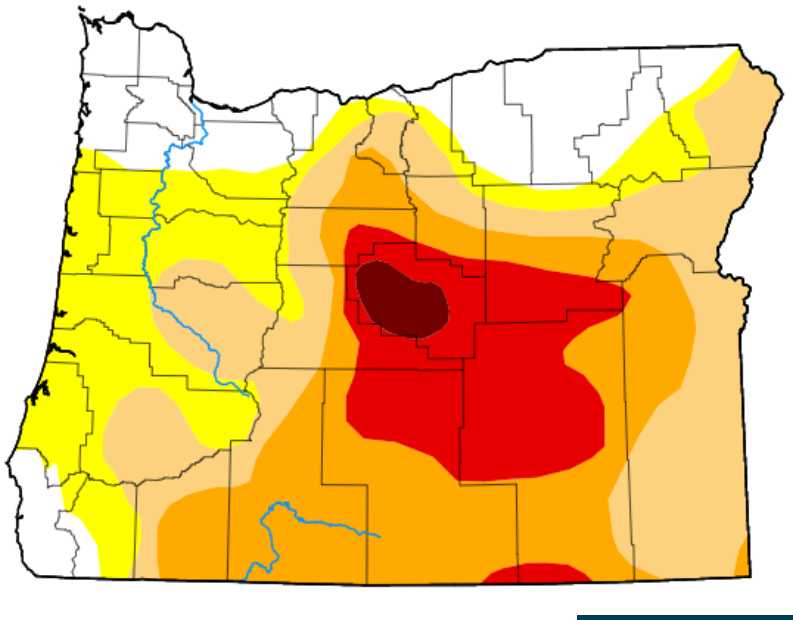
Precipitation

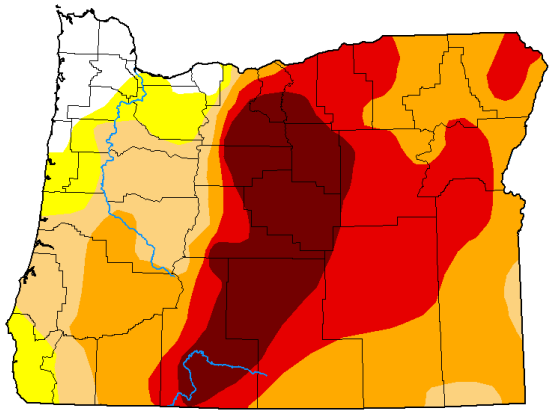


- Large monthly temperature variations likely, but those may "balance out" over the 3-month period. Heightened chances for a cold outbreak in February, which would skew temperatures colder than those shown.
- Near or slightly above-average precipitation.

https://www.oregon.gov/oda/programs/NaturalResources/Pages/Weather.aspx

United States Drought Monitor - Oregon





February 01, 2021

Map released: Thurs. February 2, 2023

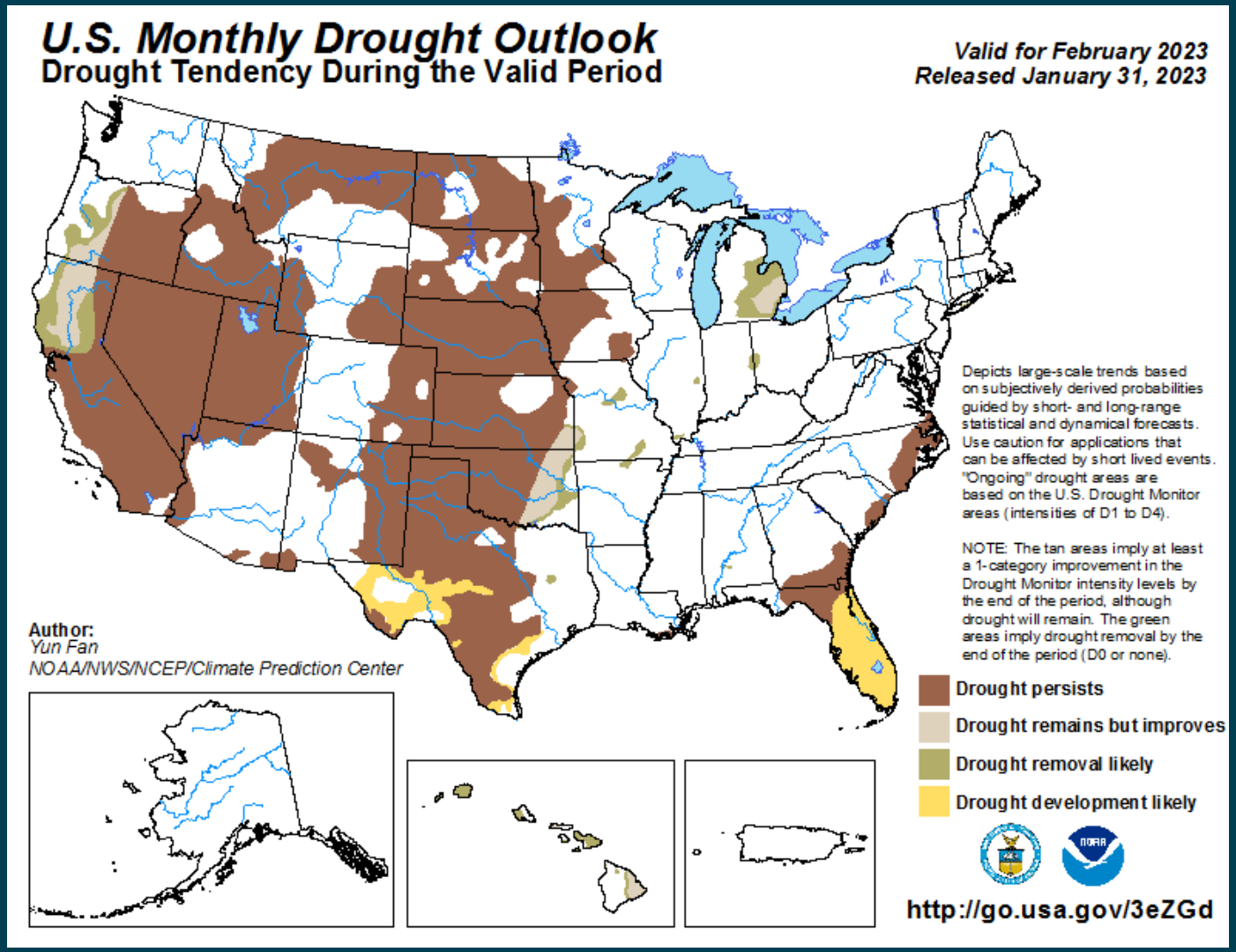
Data valid: January 31, 2023 at 7 a.m. EST

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OR

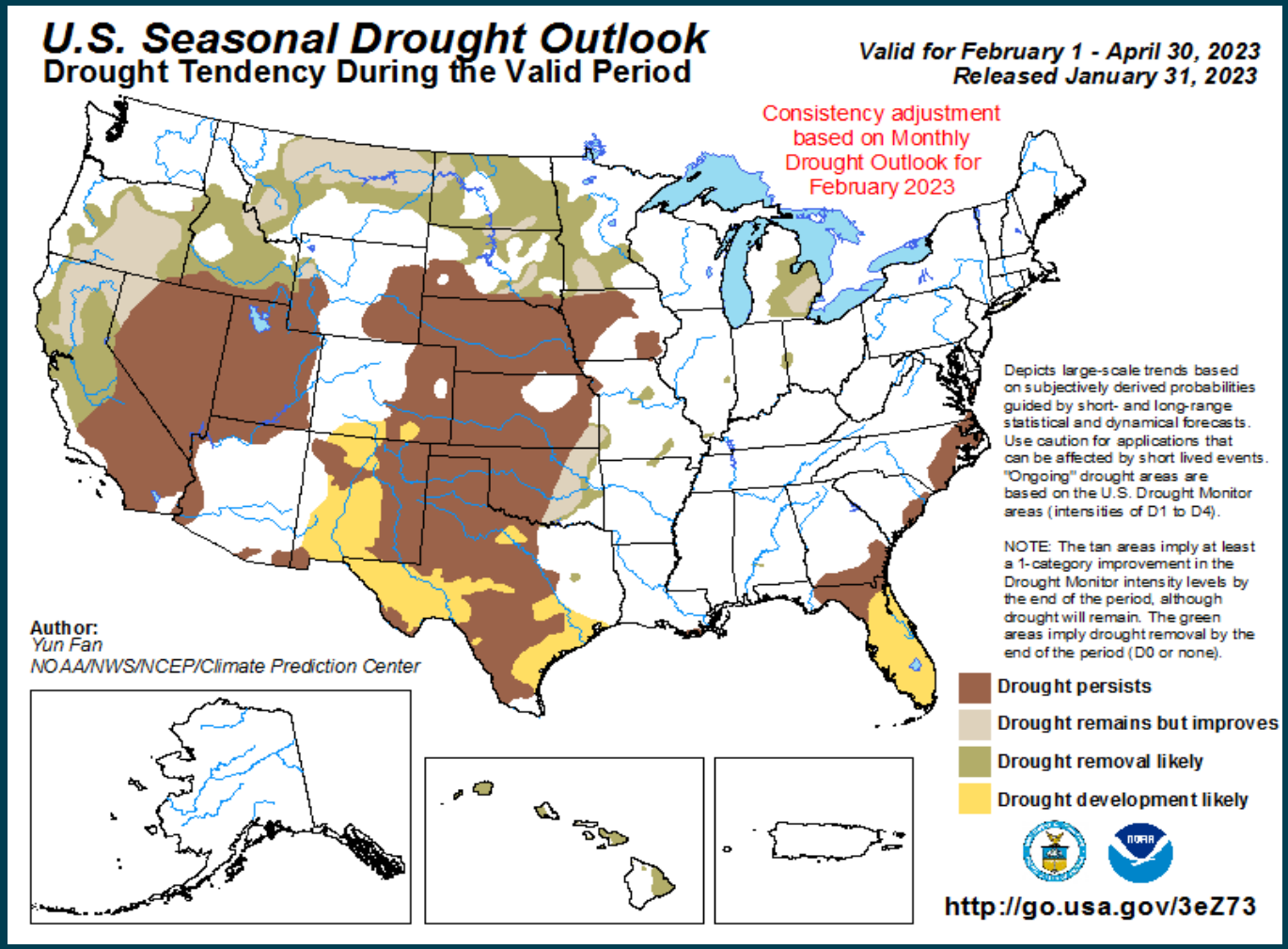
U.S. Monthly Drought Outlook - February 2023



Next Seasonal Outlook issuance date: **February 28, 2023, at 3:00pm EDT**

https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php

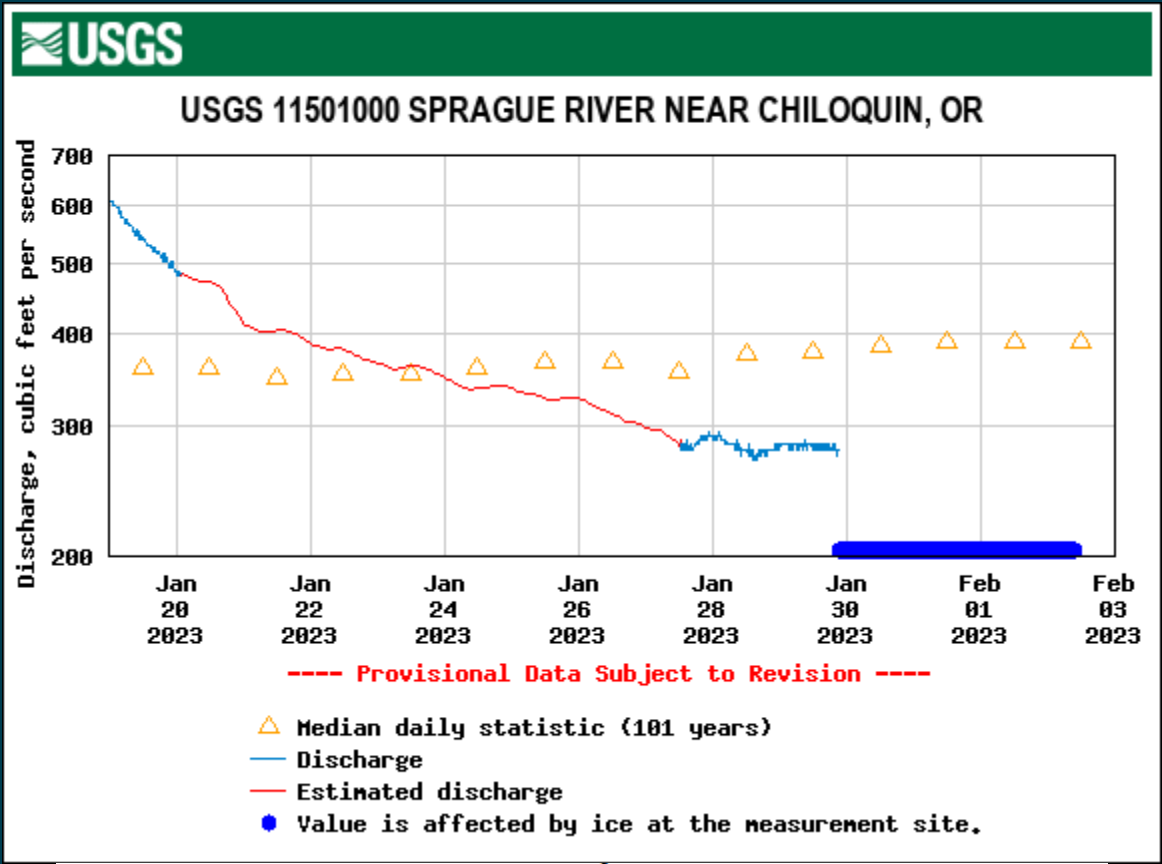
U.S. Seasonal Drought Outlook
January 19 – April 30, 2023



Next Seasonal Outlook issuance date: **February 16, 2023, at 8:30am EDT**

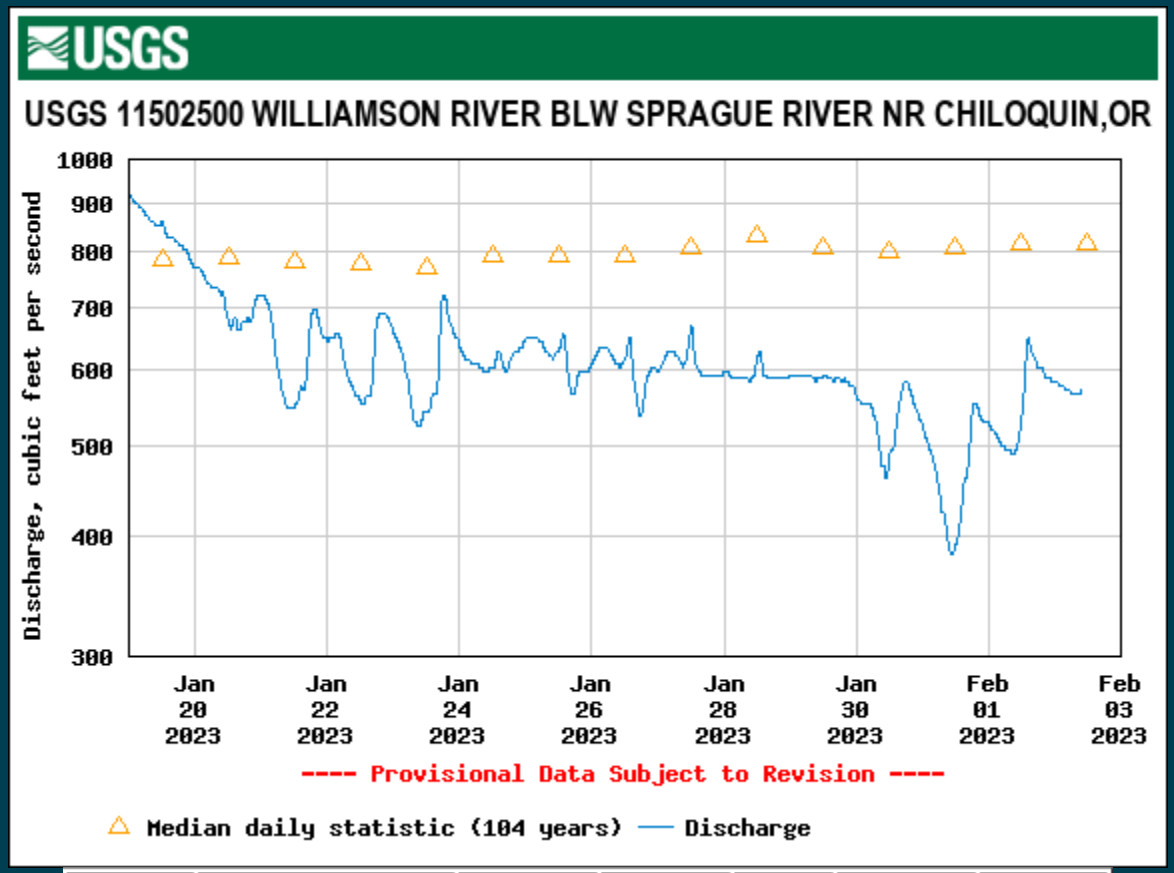
https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php

Sprague River - USGS 11501000



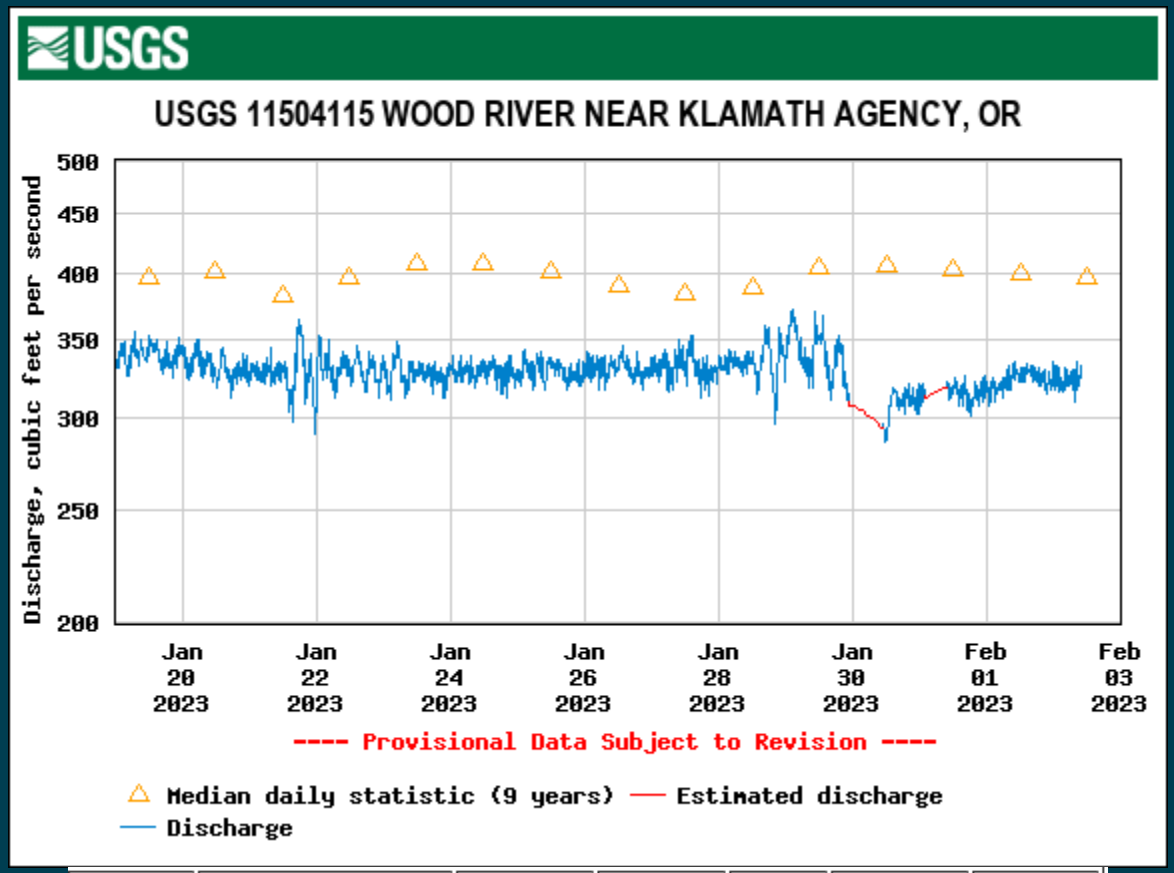
Most Recent Instantaneous Value Feb 2	Min (1936)	25th percen-tile	Median	75th percen-tile	Mean	Max (1965)
-- unavailable --	210	297	390	557	572	4420

Williamson River - USGS 11502500



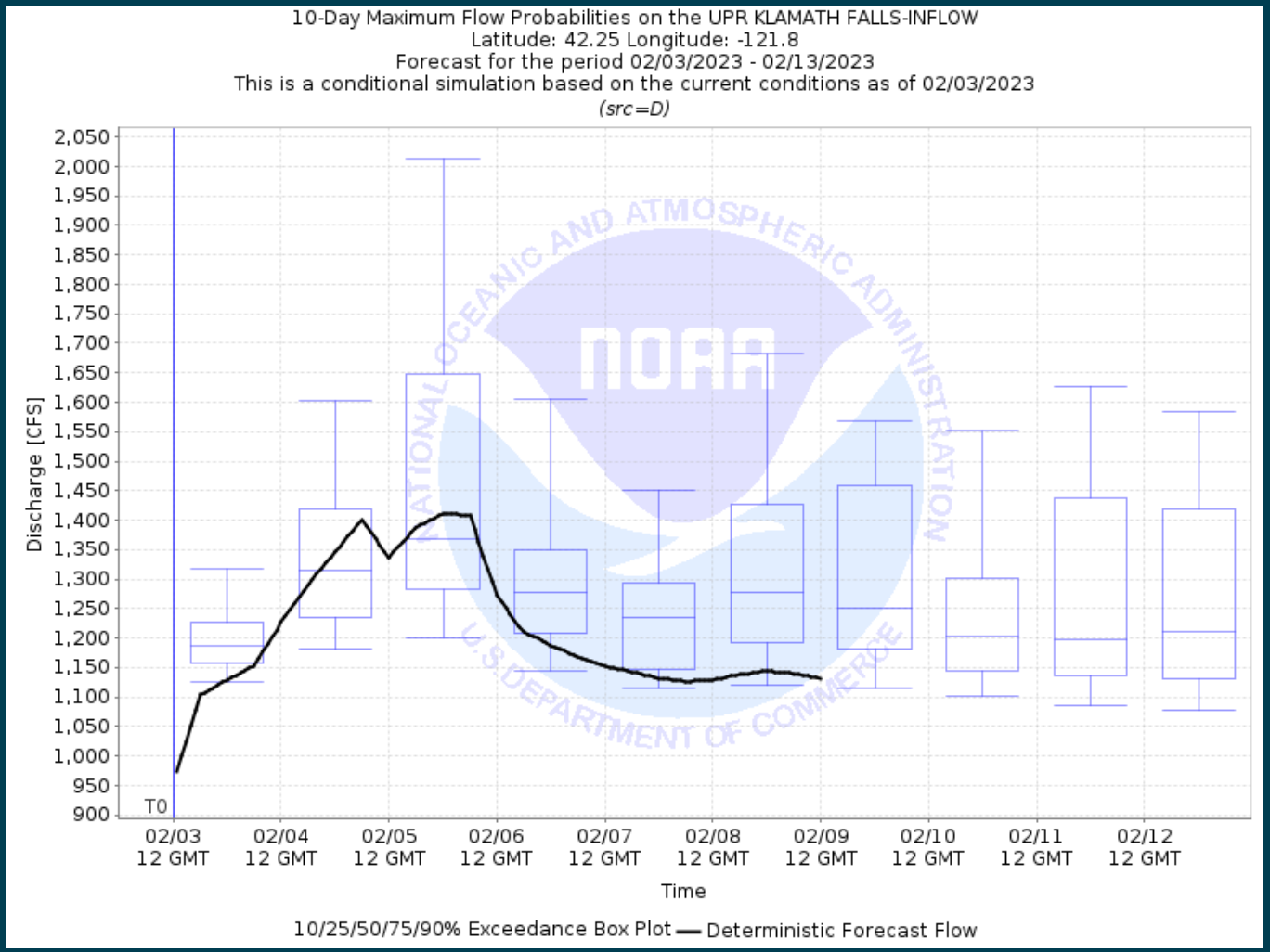
Min (1932)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1965)
537	573	657	816	1040	1110	5690

Wood River – USGS 11504115

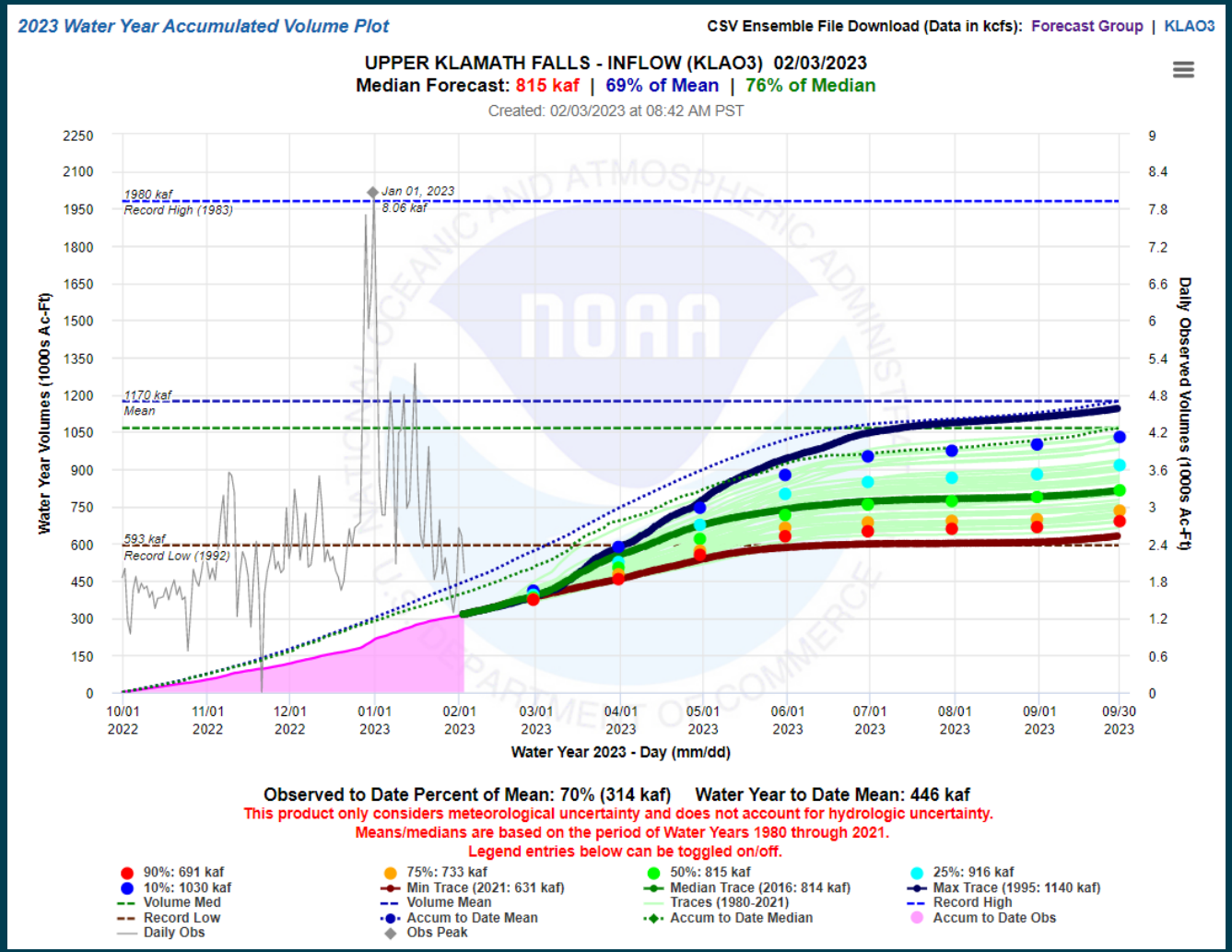


Min (2022)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (2018)
326	330	370	397	404	450	483

Williamson River Forecast – CNRFC
10-Day



Williamson River Forecast – CNRFC WY2023



UKL Cumulative Net Inflow
WY2023 & Period-of-Record (POR)-to-Date

WY	Cumulative UKL Net Inflow (TAF)
2021	286.36
2014	288.90
1992	300.66
2022	306.61
1991	308.21
2023	**317.61**
1994	331.72
2019	336.37
1993	342.72
2020	343.88
2005	347.40
2018	355.77
2010	360.55
1995	360.57
2004	362.05
2012	369.18
2001	387.51
2016	387.85
1990	388.99
2015	389.68
2003	391.69

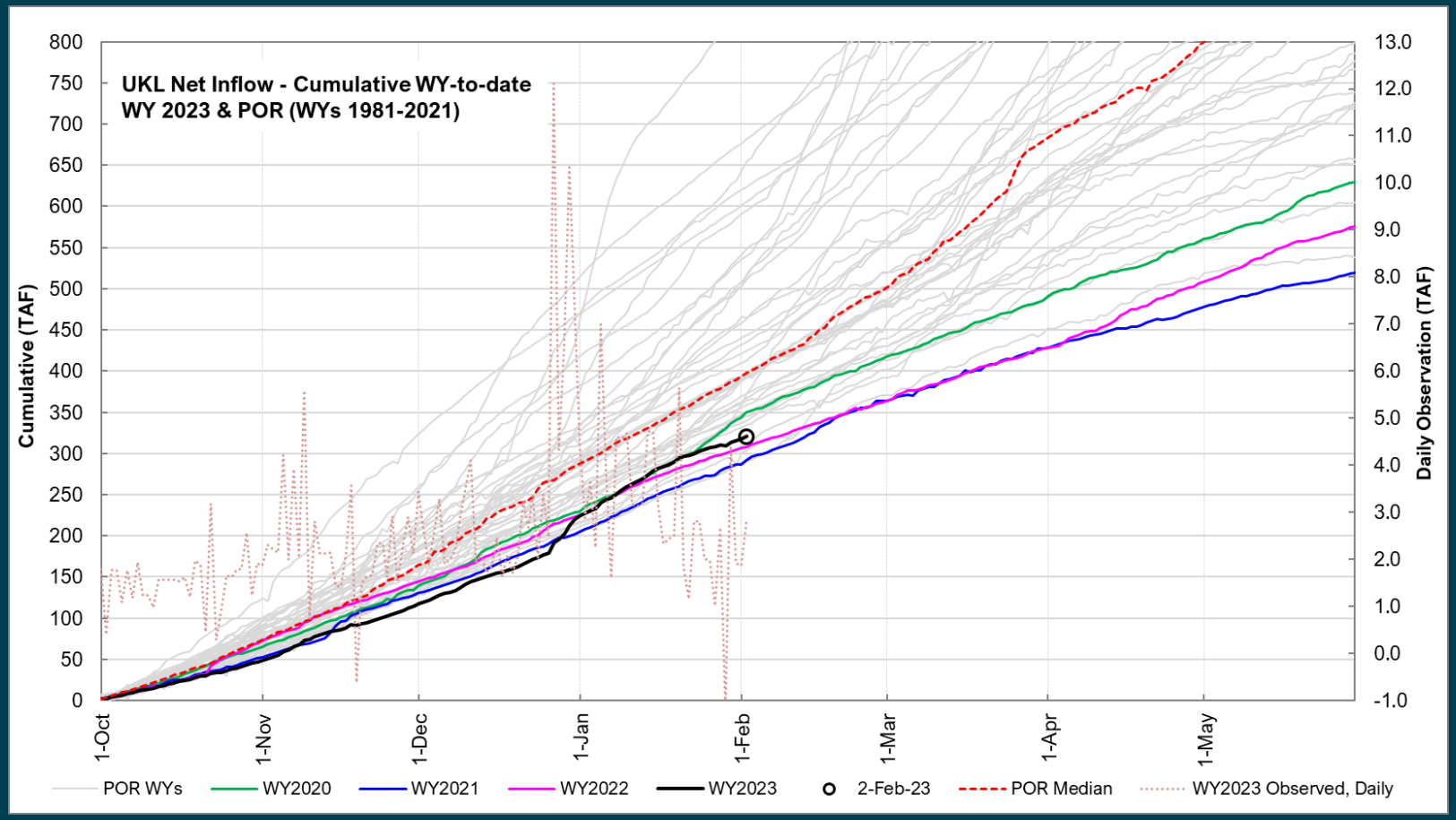
% of POR median = 81%
% of POR average = 74%

WY	Cumulative UKL Net Inflow (TAF)
1989	392.29
2008	393.07
2013	394.25
2009	394.34
1981	394.45
2017	409.89
2007	421.22
1988	432.39
2002	440.73
1987	458.64
2011	465.56
1998	502.66
2000	502.91
1986	507.97
1996	536.19
1983	541.21
1999	590.94
1985	601.32
1982	620.06
2006	643.40
1984	677.02
1997	849.36

POR median

WY2022/2023 data are provisional and subject to revision

UKL Cumulative Net Inflow
WY2023 and POR-to-date



WY2022/2023 data are provisional and subject to revision

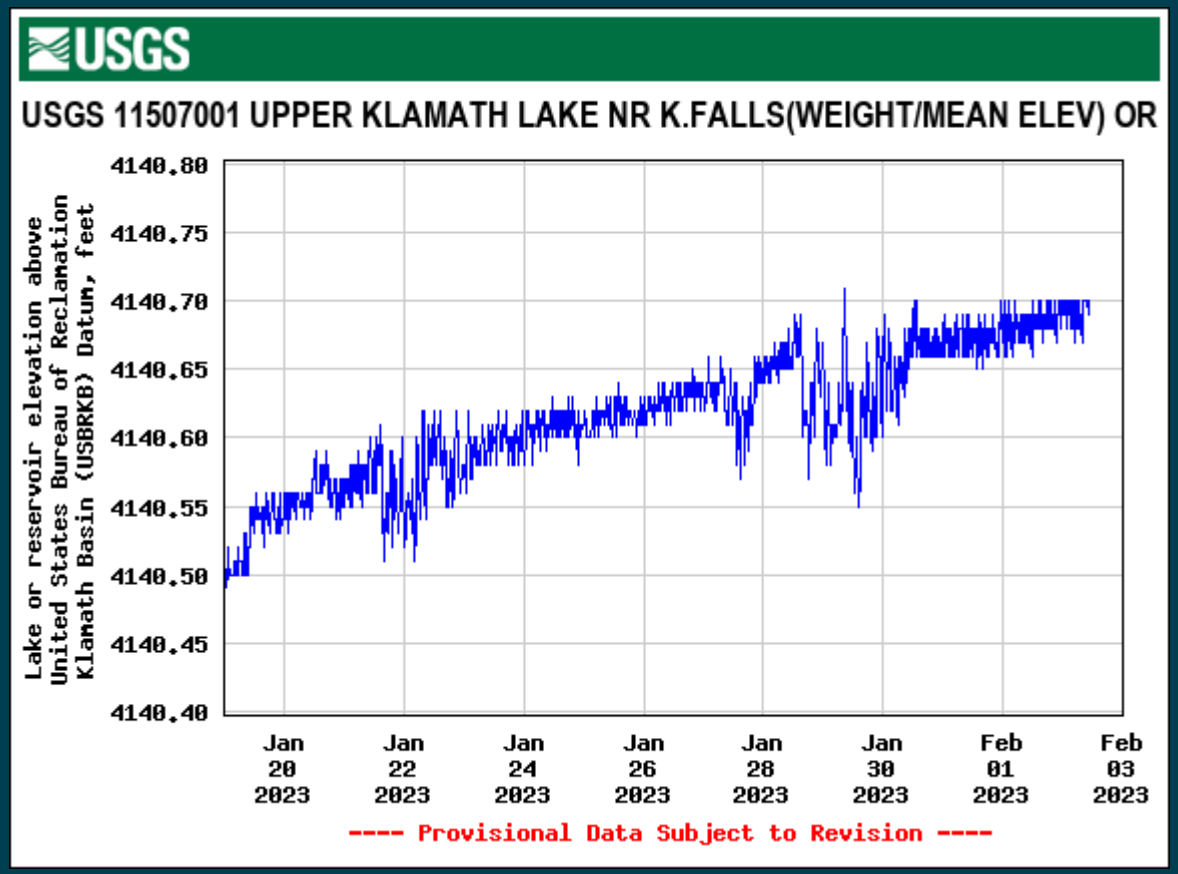
Observed UKL Net Inflow
January 26 – February 1

Date	Observed UKL Net Inflow (CFS)	Observed Percentile**
1/26/2023	995	Min
1/27/2023	508	Min
1/28/2023	1352	5%
1/29/2023	-646	Min
1/30/2023	2219	59%
1/31/2023	972	Min
2/1/2023	944	2%
Average	**906***	

*Above date range: POR Minimum 7-day daily average = 959 CFS
**POR: WYs 1981-2021

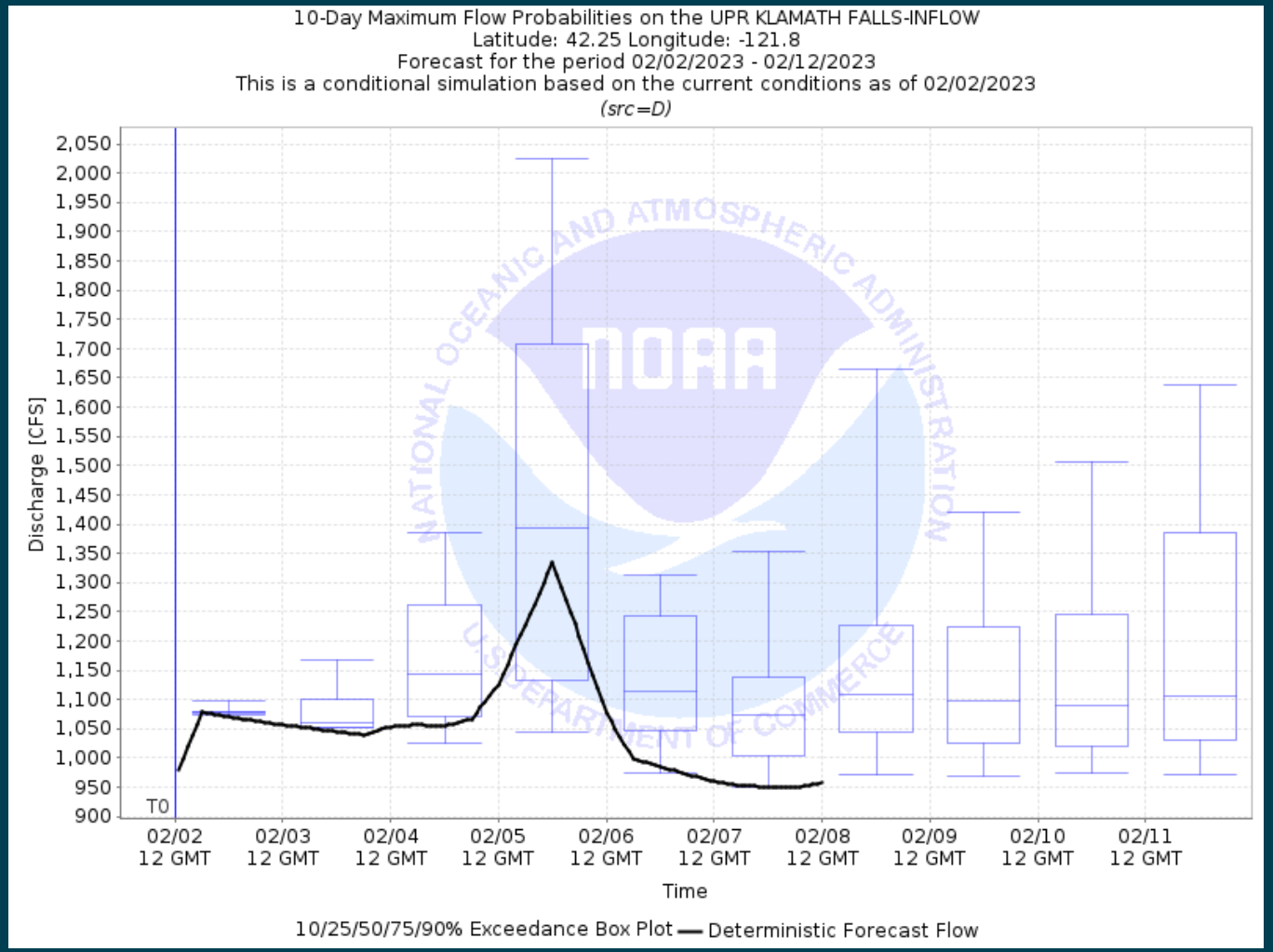
Data are provisional and subject to revision

UKL Water Surface Elevation
January 19 – Present Day

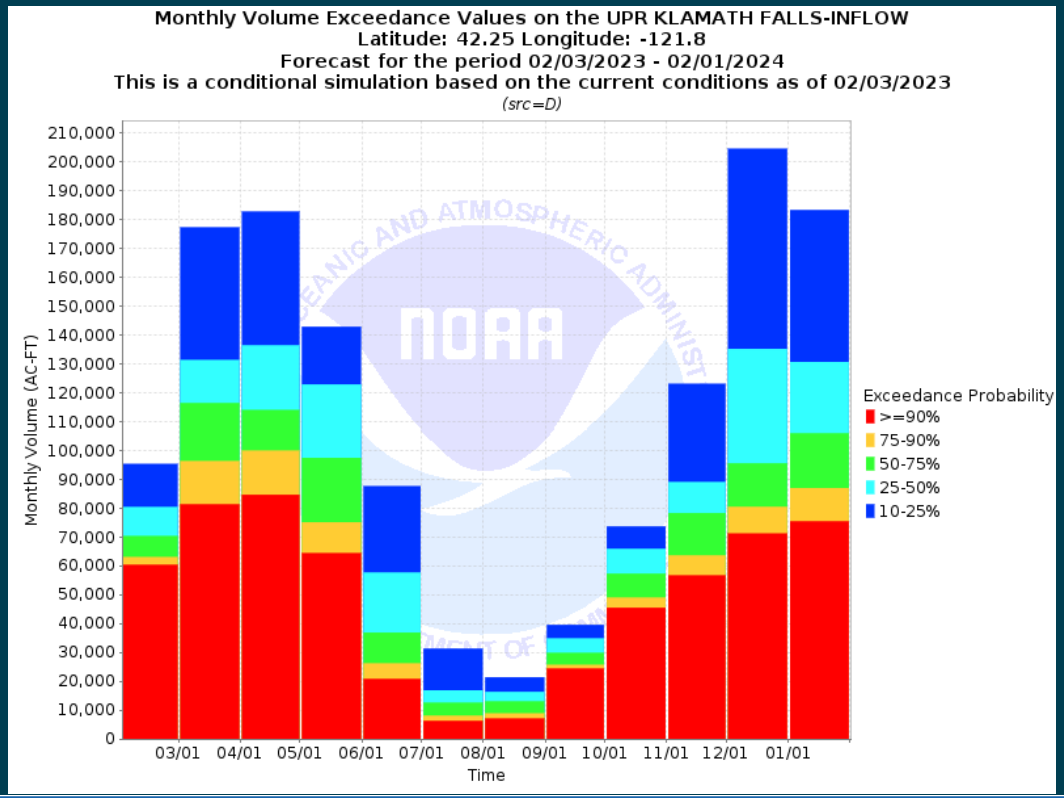


DATE	ELEVATION (FT)
1/19/2022	4140.50
1/20/2022	4140.56
1/21/2022	4140.57
1/22/2022	4140.57
1/23/2022	4140.59
1/24/2022	4140.61
1/25/2022	4140.62
1/26/2022	4140.63
1/27/2022	4140.63
1/28/2022	4140.65
1/29/2023	4140.62
1/30/2023	4140.66
1/31/2023	4140.67
2/01/2023	**4140.68**

Upper Klamath Lake (UKL) Net Inflow Forecast – CNRFC 10-Day



Upper Klamath Lake (UKL) Net Inflow Forecast – CNRFC WY2023



Monthly Streamflow Volume (1000s of Acre-Feet) Data Updated: Feb 03 2023 at 8:40 AM PST												
Prob	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
10%	102.3	177.3	182.8	142.9	87.5	31.3	21.4	39.5	73.6	123.0	204.6	183.4
25%	87.5	131.3	136.4	122.9	57.6	16.9	16.3	34.8	65.9	89.0	135.3	130.7
50%	77.4	116.4	113.9	97.5	36.9	12.5	13.0	29.7	57.3	78.3	95.5	105.9
75%	70.1	96.3	99.9	75.1	26.1	8.0	8.7	25.6	48.9	63.6	80.4	87.0
90%	67.4	81.3	84.6	64.3	20.7	6.2	7.0	24.3	45.5	56.6	71.1	75.4
Mean	136.1	171.9	152.0	124.5	62.0	22.8	25.3	46.5	72.9	97.6	124.9	136.3
%Mean	56.9	67.7	74.9	78.3	59.5	54.8	51.4	63.9	78.6	80.2	76.5	77.7

NRCS Jan 1 Klamath River Basin (KRB) Water Supply Forecast (WSF)

USDA NRCS National Water & Climate Center
 * - DATA CURRENT AS OF: January 05, 2023 09:41:05 AM
   - Based on January 01, 2023 forecast values

KLAMATH RIVER BASIN

Forecast Point	period	50% (KAF)	% of med	max (KAF)	30% (KAF)	70% (KAF)	min (KAF)	30-yr med
Gerber Reservoir Inflow (2)	JAN-JUN	60	182	86	71	50	35	33
Sprague R nr Chiloquin	JAN-SEP	370	142	585	450	295	200	260
	MAR-SEP	280	130	465	350	215	140	215
Williamson R bl Sprague R nr Chiloquin	JAN-SEP	570	121	780	655	480	355	470
	MAR-SEP	435	121	620	510	360	250	360
Upper Klamath Lake Inflow (2)	JAN-SEP	900	119	1410	1050	765	505	755
	MAR-SEP	615	118	1030	735	505	305	520

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
Medians are for the 1991-2020 period.
All volumes are in thousands of acre-feet.

footnotes:
1) Max and Min are 5% and 95% chance that actual volume will exceed forecast
2) streamflow is adjusted for upstream storage

NRCS Jan Mid-Month KRB WSF

KLAMATH RIVER BASIN

Forecast Point	period	50% (KAF)	% of med	max (KAF)	30% (KAF)	70% (KAF)	min (KAF)	30-yr med
Sprague R nr Chiloquin	FEB-SEP	330	138	505	395	270	191	240
	MAR-SEP	285	133	445	345	230	162	215
Williamson R bl Sprague R nr Chiloquin	FEB-SEP	500	119	680	575	430	325	420
	MAR-SEP	435	121	590	500	370	275	360
Upper Klamath Lake Inflow (2)	FEB-SEP	750	120	1150	865	640	430	625
	MAR-SEP	615	118	970	715	520	340	520

Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
Medians are for the 1991-2020 period.
All volumes are in thousands of acre-feet.

footnotes:
1) Max and Min are 5% and 95% chance that actual volume will exceed forecast
2) streamflow is adjusted for upstream storage

The net outcome remains, overall, a current best-estimate prediction of significantly above-normal spring-summer streamflow volumes reflecting a generally well above-normal mountain snowpack, with some basin-to-basin variability. Please note, however, that early-season forecasts like this January 15 prediction have comparatively low skill, as much of the winter-spring snowpack accumulation, the main source of prediction skill in operational WSF models, has yet to occur. This forecast uncertainty is reflected in the comparatively wide prediction intervals (given as the stated 10%, 30%, 70%, and 90% exceedance flows in the attached file) around the best estimate. Forecast product users should bear those uncertainty estimates in mind when interpreting the WSFs and using them for water resource decision-making.

NRCS Feb 1 Klamath River Basin (KRB) Water Supply Forecast (WSF)

USDA NRCS National Water & Climate Center
 * - DATA CURRENT AS OF: February 02, 2023 10:38:29 AM
   - Based on February 01, 2023 forecast values

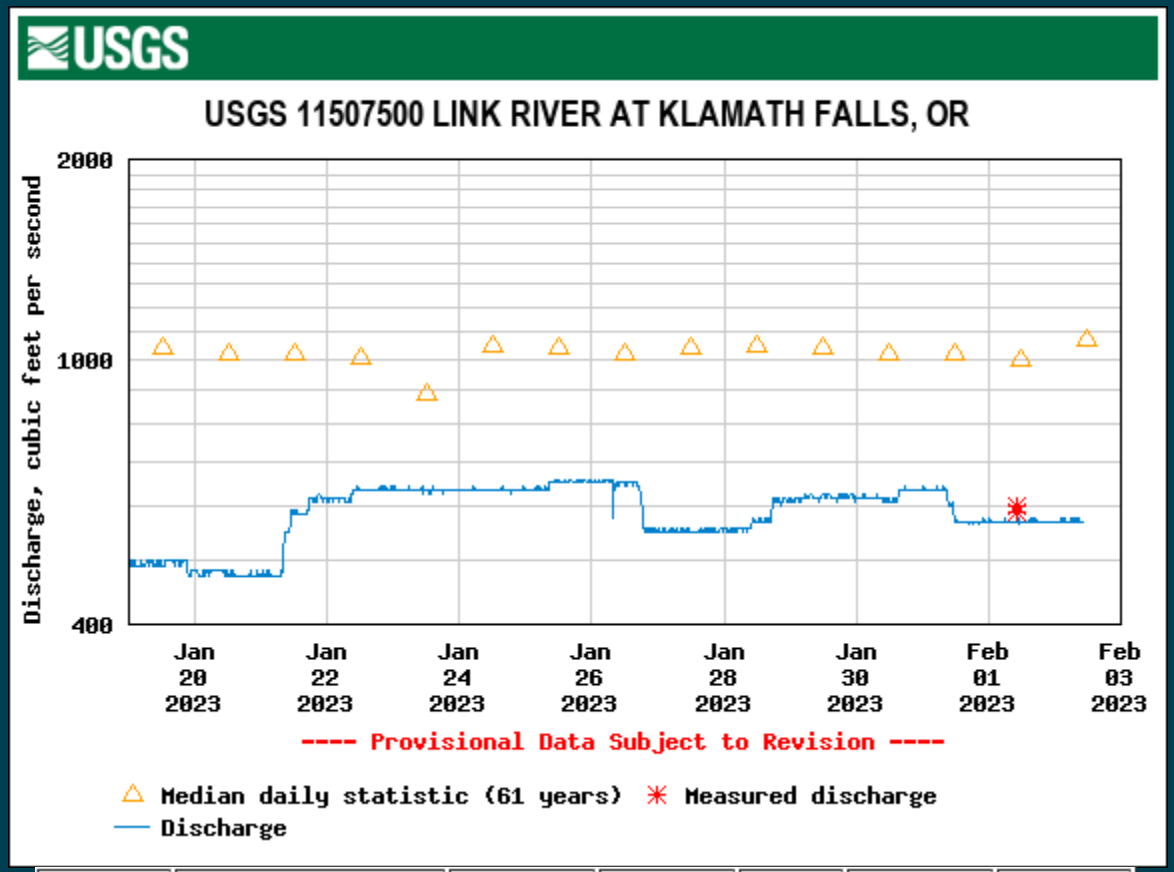
KLAMATH RIVER BASIN

Forecast Point	period	50% (KAF)	% of med	max (KAF)	30% (KAF)	70% (KAF)	min (KAF)	30-yr med
Gerber Reservoir Inflow (2)	FEB-JUN	41	158	60	49	34	23	26
Sprague R nr Chiloquin	FEB-SEP	275	115	405	325	230	173	240
	MAR-SEP	240	112	360	285	198	144	215
Williamson R bl Sprague R nr Chiloquin	FEB-SEP	455	108	600	515	395	305	420
	MAR-SEP	395	110	530	450	340	260	360
Upper Klamath Lake Inflow (2)	FEB-SEP	680	109	990	770	595	425	625
	MAR-SEP	555	107	830	635	480	335	520
Clear Lake Inflow (2)	FEB-JUN	46	253	93	65	27	-1.49	18.2

 Max (10%), 30%, 50%, 70% and Min (90%) chance that actual volume will exceed forecast.
 Medians are for the 1991-2020 period.
 All volumes are in thousands of acre-feet.

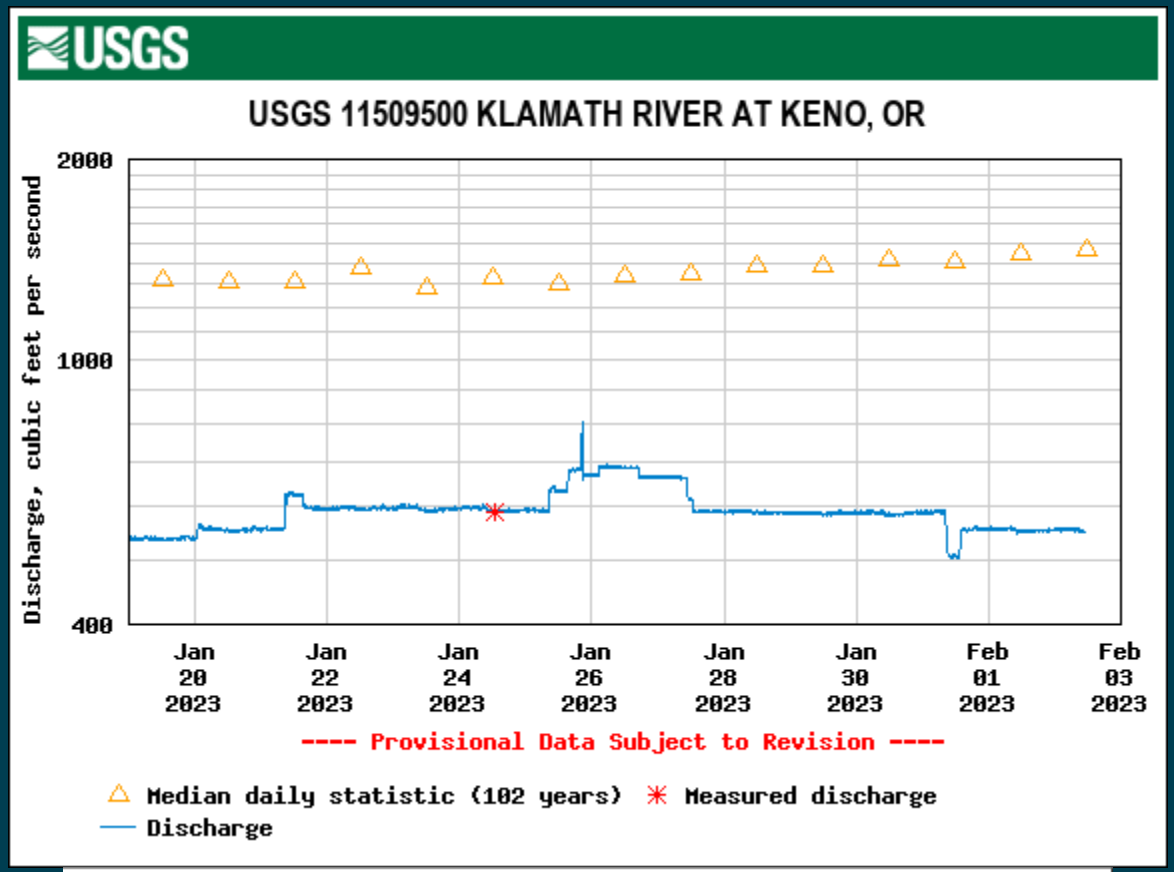
 footnotes:
 1) Max and Min are 5% and 95% chance that actual volume will exceed forecast
 2) streamflow is adjusted for upstream storage

Link River Dam- USGS 11507500



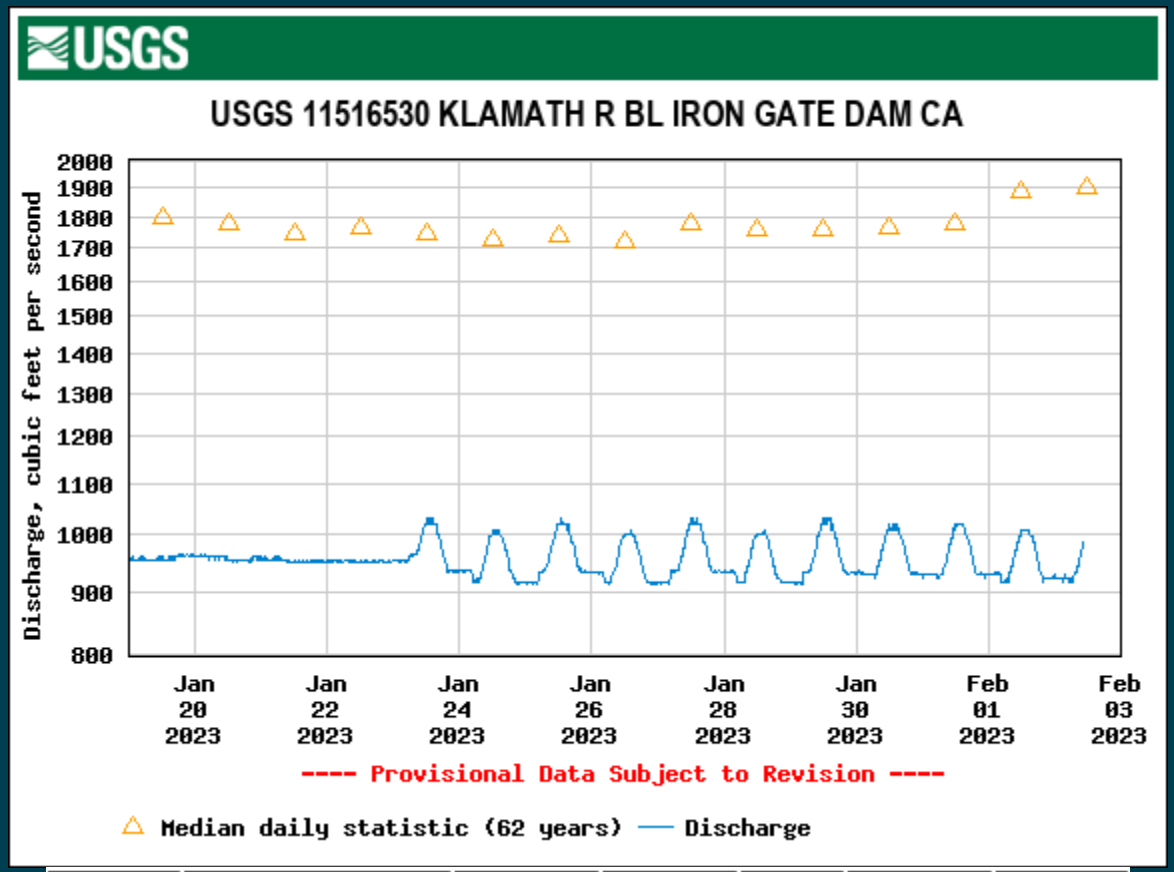
Min (1932)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1965)
537	583	657	816	1040	1110	5690

Keno Dam – USGS 11509500



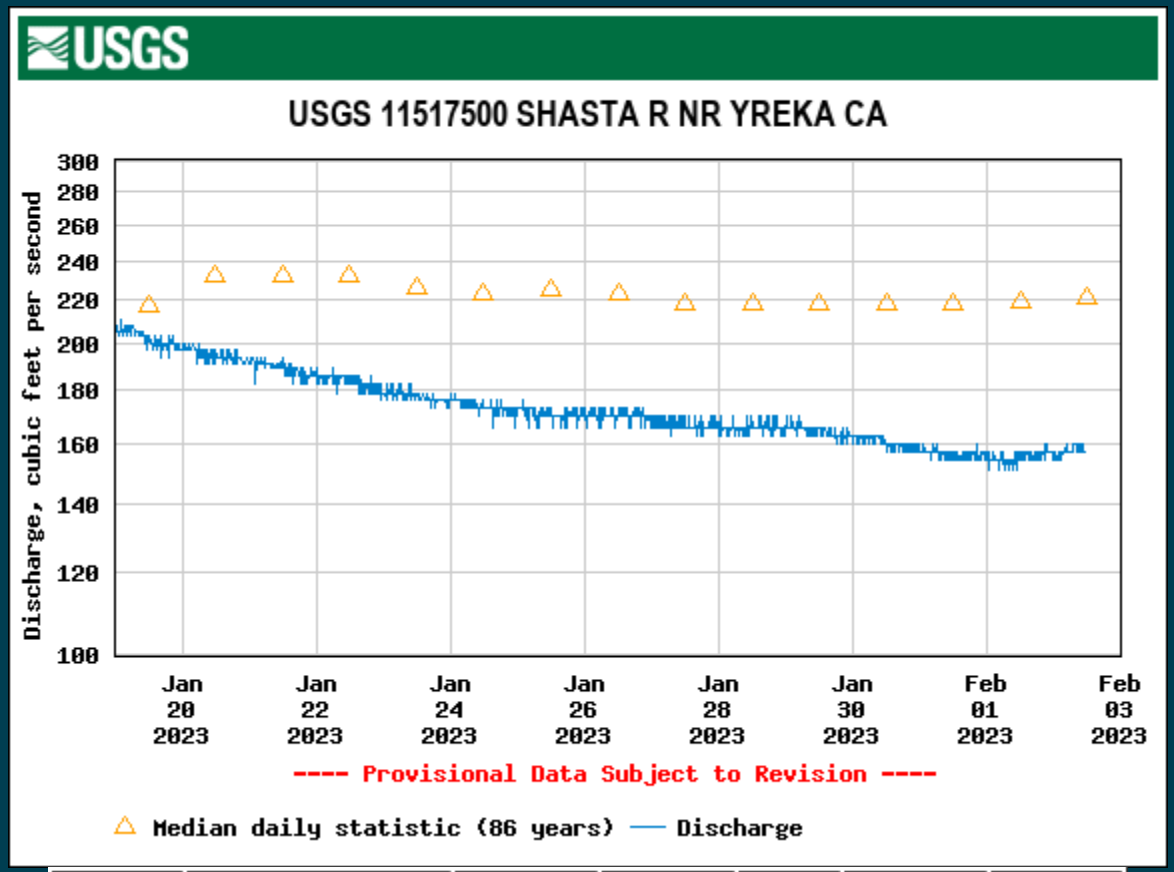
Min (1935)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1965)
204	549	889	1470	1860	2540	8280

Iron Gate Dam – USGS 11516530



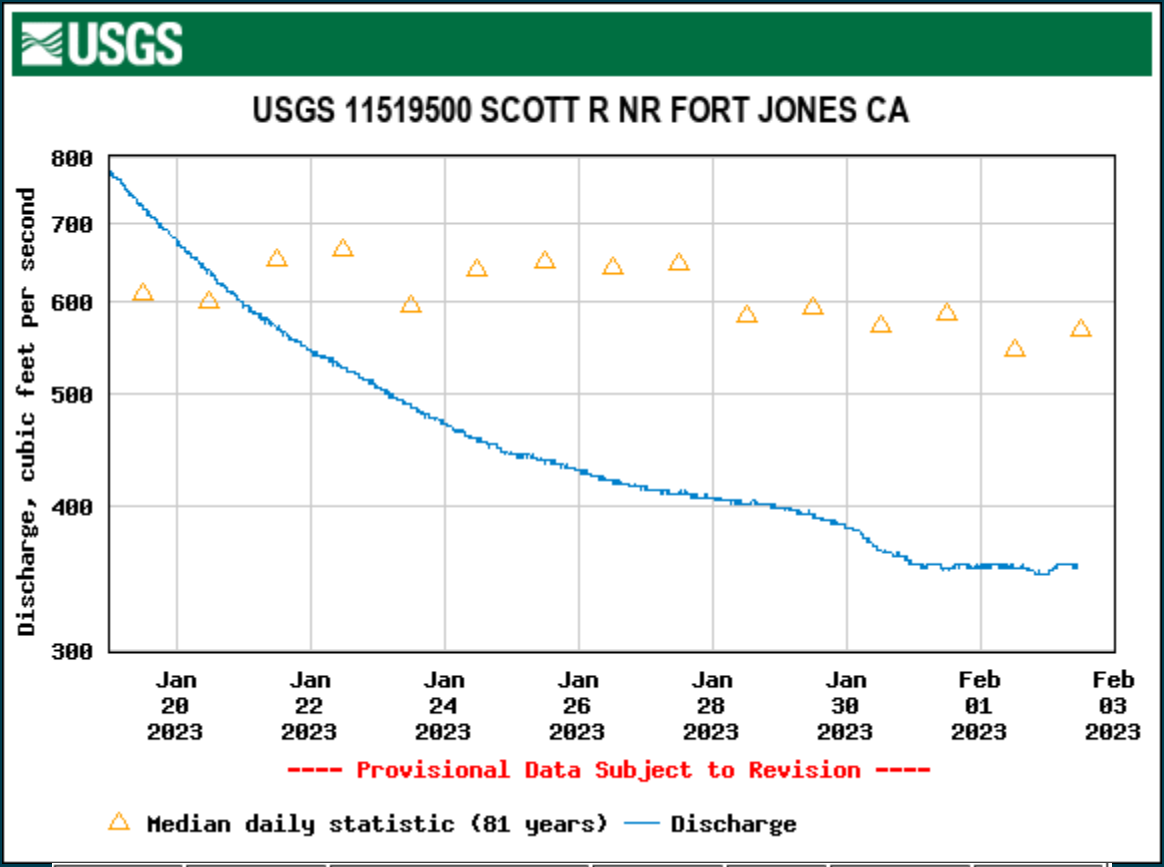
Min (1992)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1965)
550	987	1310	1900	2560	3120	11300

Shasta River – USGS 11517500



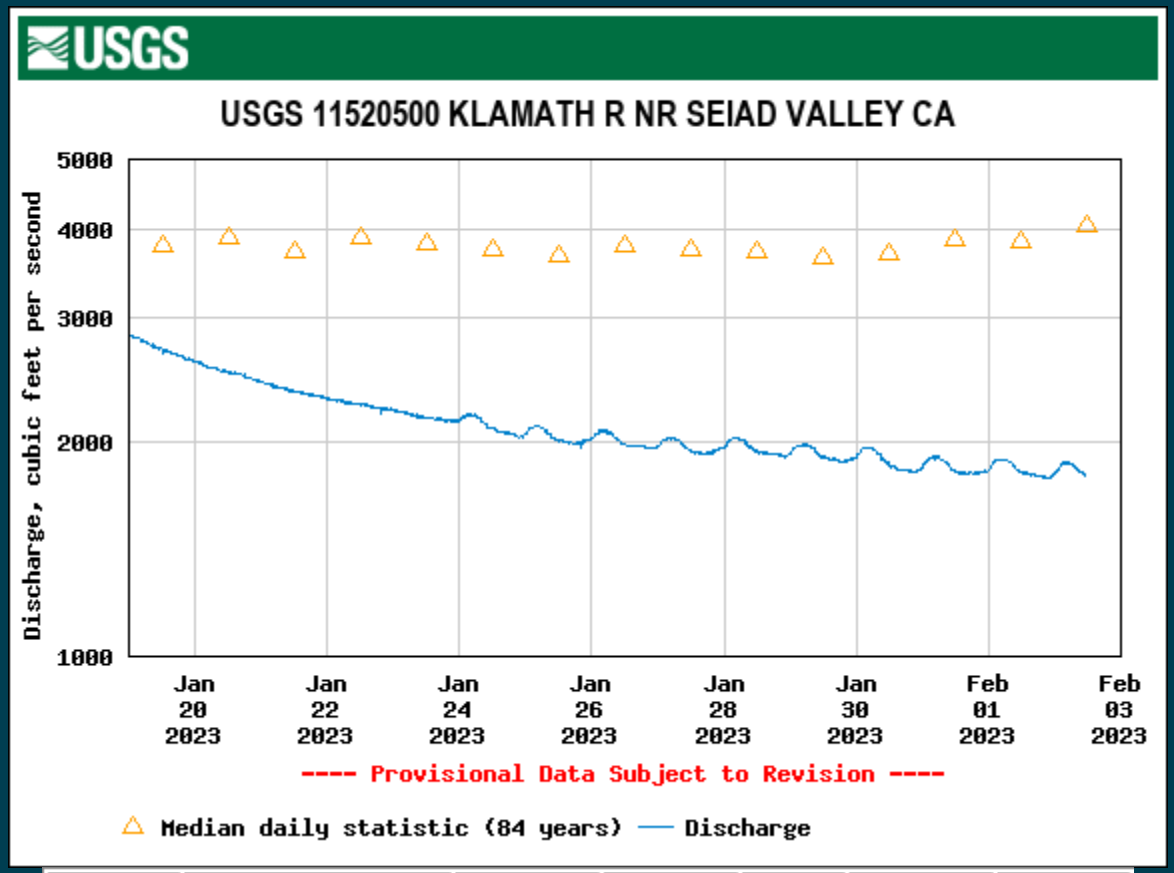
Min (1937)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1952)
114	157	180	221	307	337	1610

Scott River – USGS 11519500



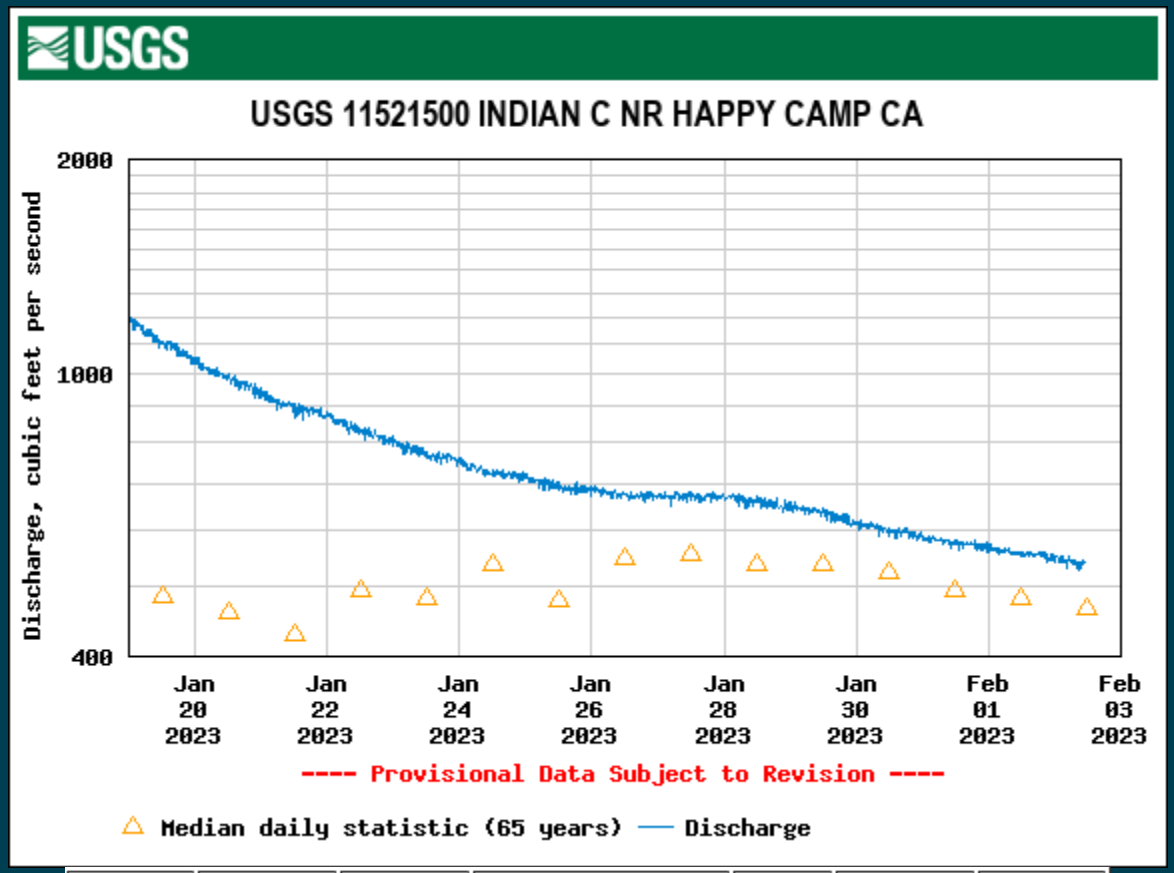
Min (2014)	25th percen-tile	Most Recent Instantaneous Value Feb 2	Median	Mean	75th percen-tile	Max (1995)
80.5	309	357	567	1060	1360	8180

Klamath River – USGS 11520500



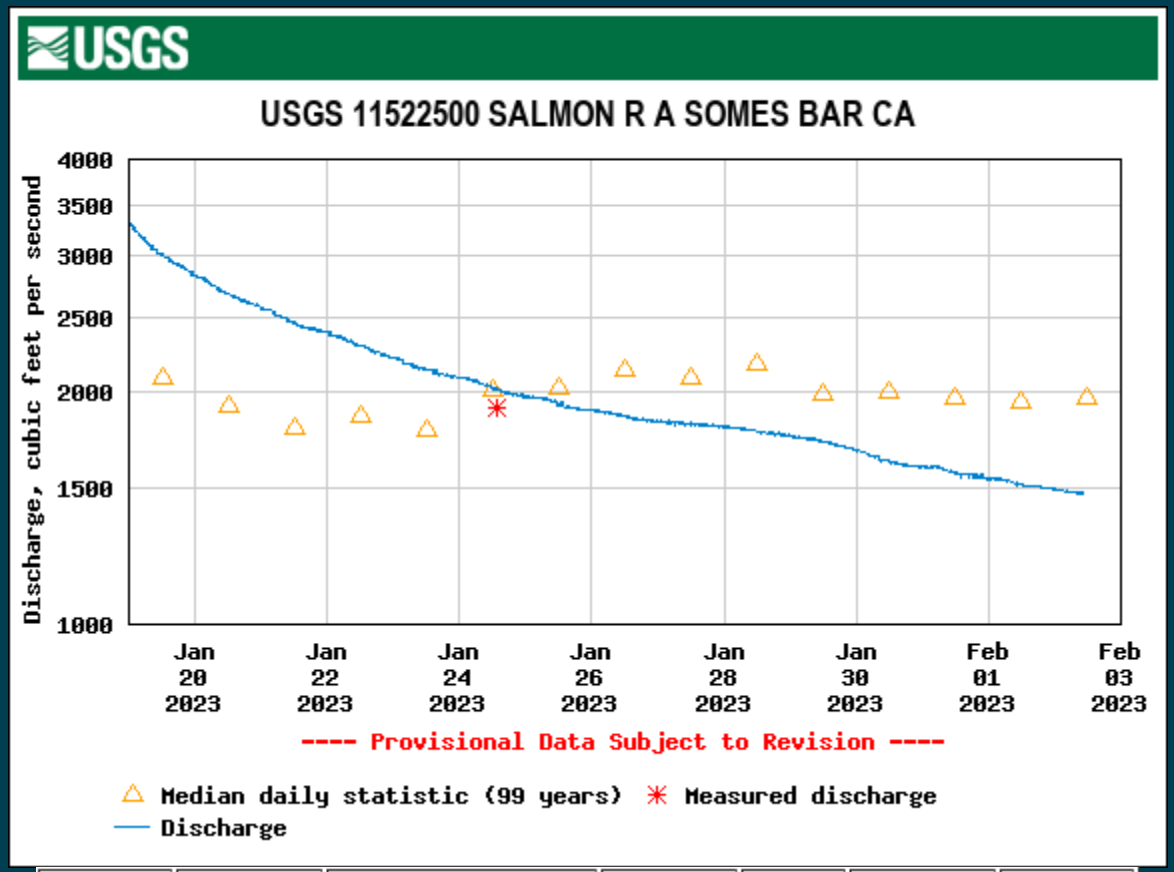
Min (1992)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1952)
1210	1790	2660	4030	5480	6490	23400

Indian Creek – USGS 11521500



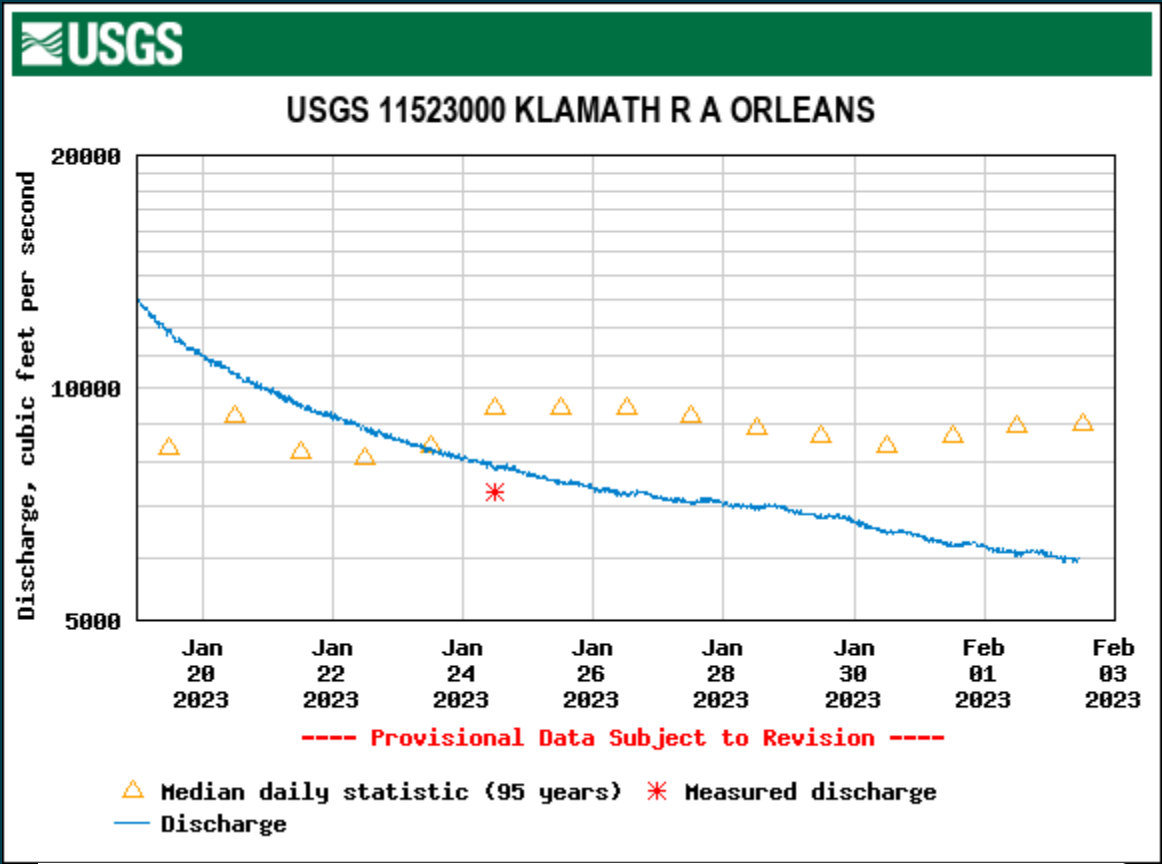
Min (1977)	25th percen-tile	Median	Most Recent Instantaneous Value Feb 2	Mean	75th percen-tile	Max (1995)
49.0	321	468	542	716	886	3450

Salmon River – USGS 11522500



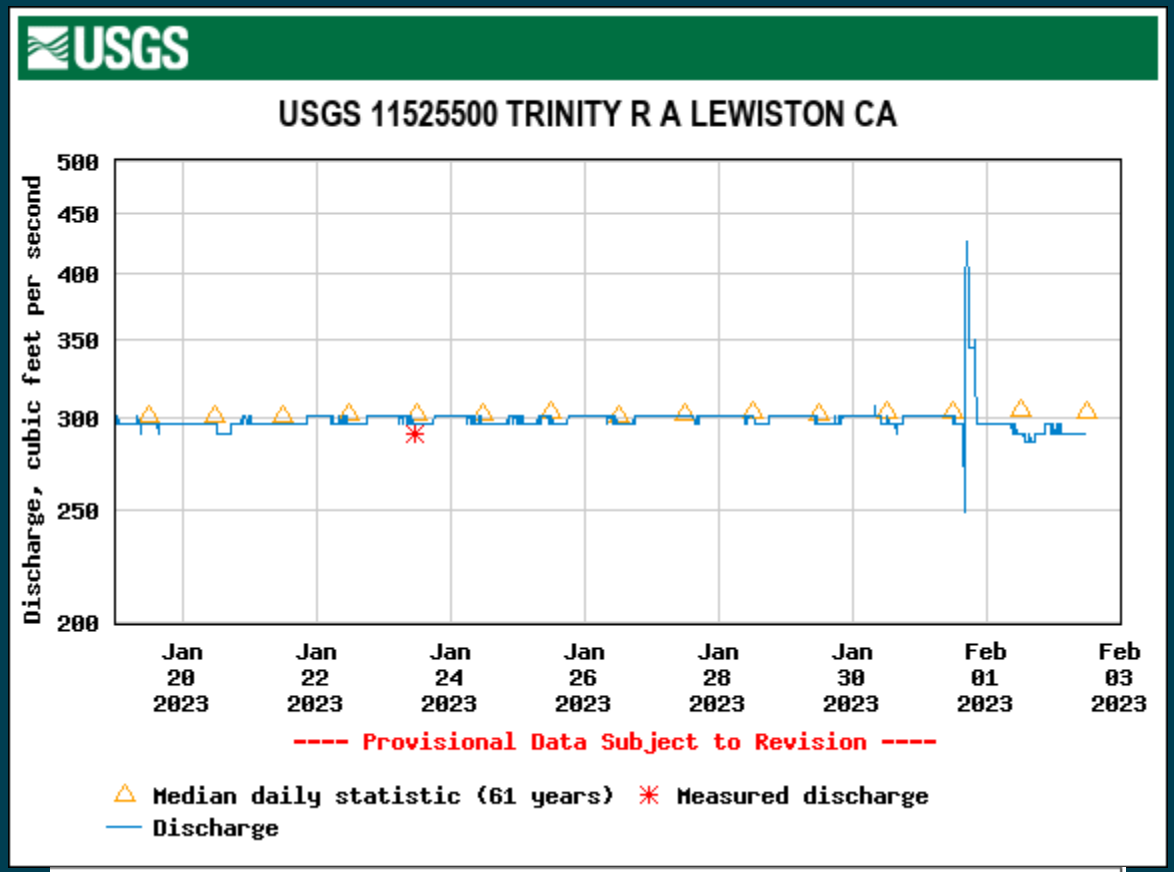
Min (1977)	25th percen-tile	Most Recent Instantaneous Value Feb 2	Median	Mean	75th percen-tile	Max (2006)
194	1110	1470	1970	2860	3580	18700

Klamath River – USGS 11523000



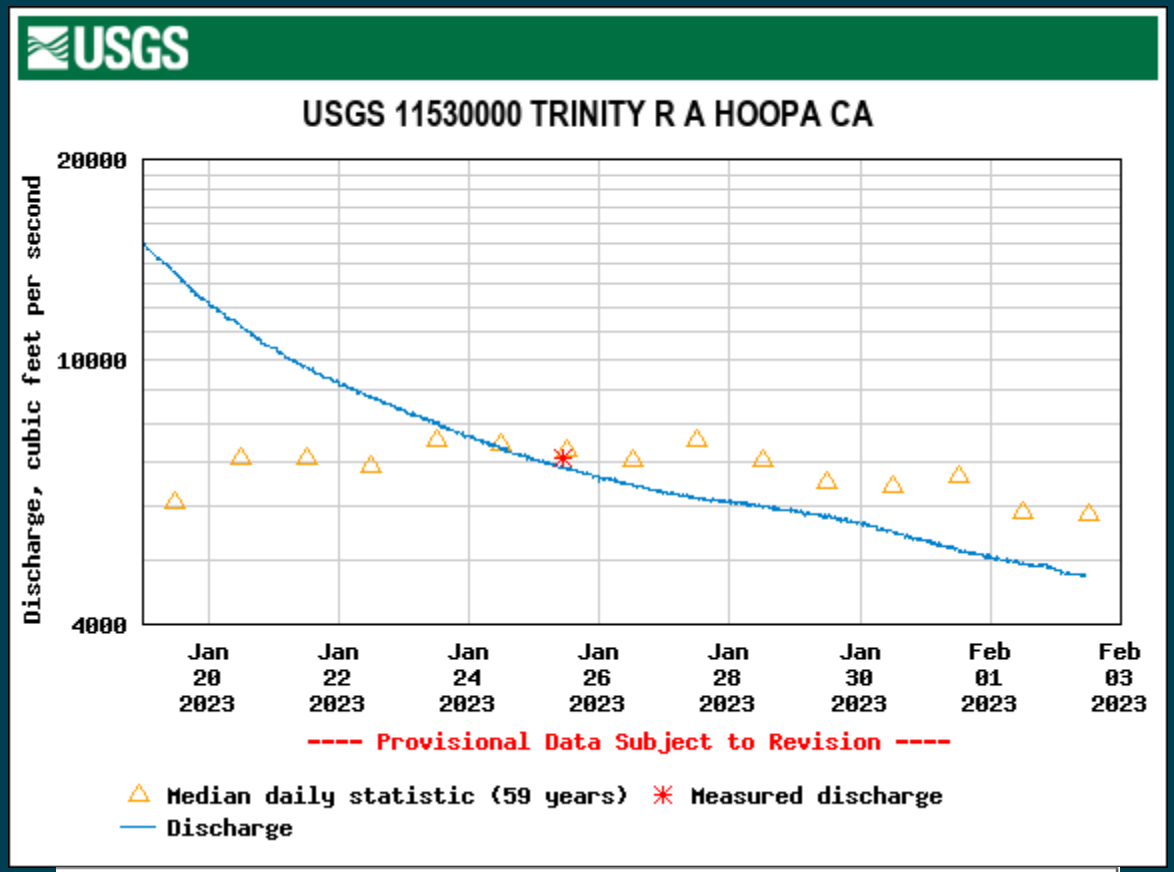
Min (2014)	25th percen-tile	Most Recent Instantaneous Value Feb 2	Median	Mean	75th percen-tile	Max (1995)
2120	5770	5990	8960	12900	17000	71700

Trinity River at Lewiston – USGS 11525500



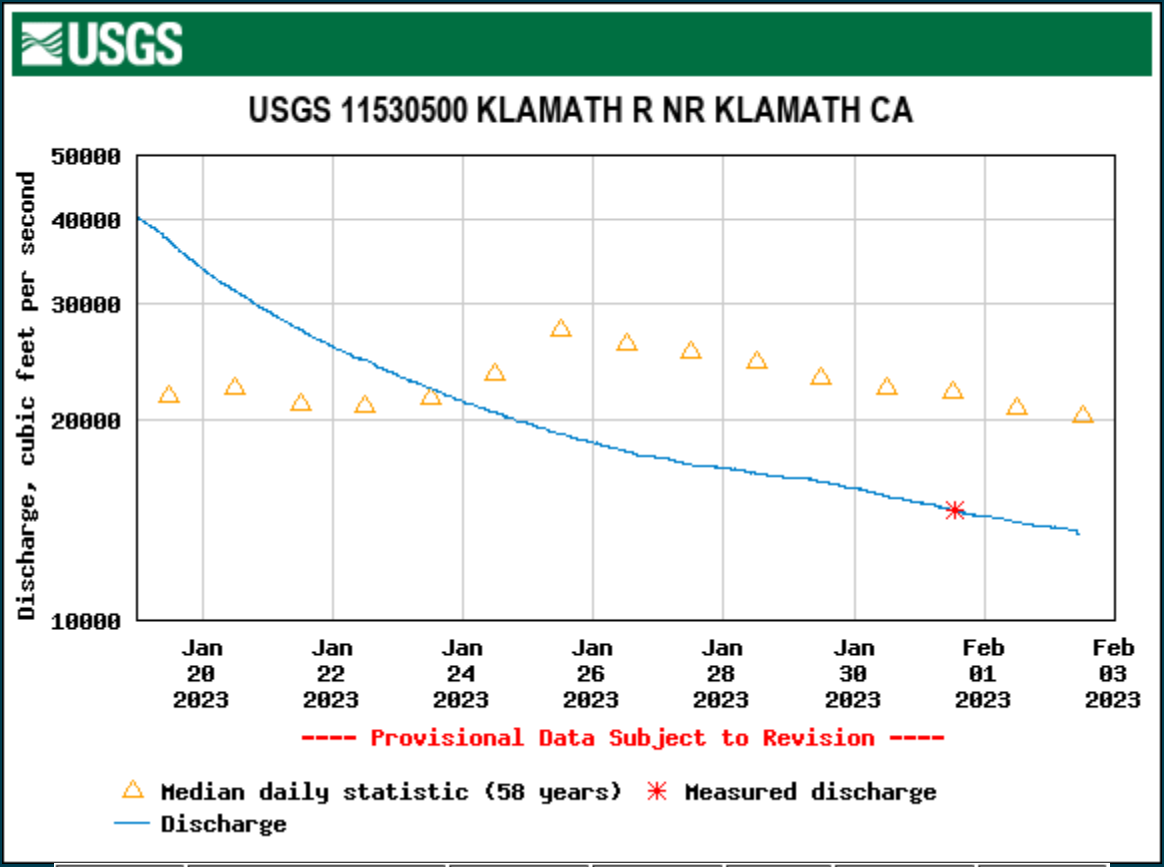
Min (1977)	25th percen-tile	Most Recent Instantaneous Value Feb 2	Median	75th percen-tile	Mean	Max (1997)
143	285	291	304	315	509	6840

Trinity River – USGS 11530000



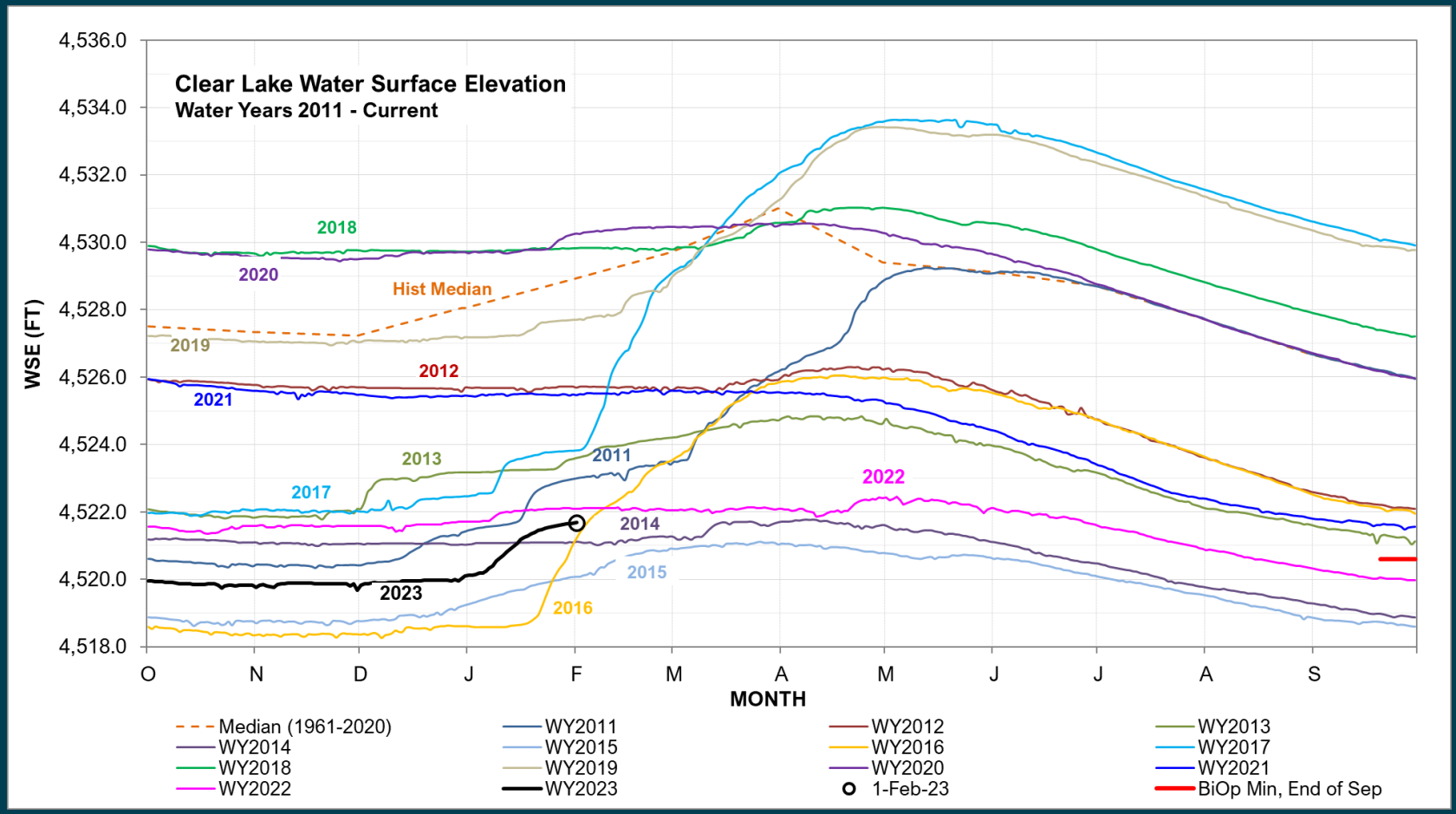
Min (1977)	25th percen-tile	Most Recent Instantaneous Value Feb 2	Median	Mean	75th percen-tile	Max (1995)
653	3180	4720	5860	8780	9880	49500

Klamath River – USGS 11530500



Min (1977)	Most Recent Instantaneous Value Feb 2	25th percen-tile	Median	Mean	75th percen-tile	Max (1995)
3570	13500	14100	20300	30300	36300	199000

Clear Lake Reservoir – USBR



Gerber Reservoir – USBR